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A JOINT PUBLICATION OF THE SOUTHERN ECONOMIC ASSOCIATION AND THE UNIVERSITY OF NORTH CAROLINA

Volume XXII, Number 2 OCTOBER 1955

# *The* SOUTHERN ECONOMIC JOURNAL

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# THE STATE COLLEGE OF BUSINESS ADMINISTRATION

## ATLANTA, GEORGIA

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# ADVOCACY VERSUS ANALYSIS IN ECONOMICS

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## I. INTRODUCTION AND OBJECTIVES

Methodological controversy in economics is anything but a recent phenomenon. Polemical exchanges concerning the nature of economics tend to flare sporadically and then ultimately perish, shrouded in an intellectual stalemate and/or the verbal exhaustion of all participants. The net result of such scholarly debates is rarely compromise. Indeed, a solidification of the respective positions of each school of thought and an increasing unwillingness of all directly or indirectly concerned to modify their respective theses in terms of criticisms or more realistic positions implicit in the debate are more likely outcomes. In a sense, this is understandable because it is both inconvenient and embarrassing either to reverse or modify one's stand on such a fundamental issue. Aside from refinements *within* the various positions, scholarly skirmishes concerning the methodology of economics have been markedly barren of positive results, i.e., few points of conflict have been resolved permanently.

It does not follow from the deficiency of final and conclusive results heretofore attained in the realm of methodological controversy that such inquiry is to be shunned. Indeed, the polemical questions implicit and explicit in discussions of the nature, scope, and significance of economics are of such fundamental significance to all the social sciences that further inquiry is to be fostered. "More than other scientists, social scientists need to be self-conscious about their methodology."[1] Unfortunately, such factors as personal bias, an inability to clearly state and interpret the positions of the respective schools of thought, and the development of new branches of economics[2] have all tended to cloud areas of methodological controversy so that the basic issues are currently—and perennially—in a somewhat chaotic and nebulous state. Thus the vital question, Is economics to be an objective, positive science concerned exclusively with the discovery and statement of uniformities among economic phenomena or a normative field

[1] Milton Friedman, *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), p. 40.

[2] See Oskar Lange, "The Scope and Method of Economics," *Review of Economic Studies*, Vol. 13, 1945–46, p. 21, for a brief discussion of the relationship of welfare economics to theoretical (positive) economics. Also see Allan G. Gruchy, *Modern Economic Thought* (New York: Prentice-Hall, 1947), for an excellent survey of the various branches of institutional economics.

of inquiry concerned with the derivation of economic objectives and the recommendation of guides to action? is as yet unresolved.[3]

Accordingly, the goals of this paper will be considerably more pedestrian than an attempt to clarify and resolve all the fundamental areas of conflict in the stated debate. In brief, the fundamental objectives of the present discussion are: (1) to define briefly and describe the two most basic methodological approaches to economics—policy economics and positive economics; (2) to isolate and contrast the explicit and tacit assumptions underlying these two views; (3) to survey and analyze the most fundamental points of conflict existing between the policy and the positive approaches; and (4) to attempt to account in part for the policy-positivist controversy. It should be emphasized at the outset that the policy and positivist positions as outlined herein constitute rather extreme viewpoints. This is necessary for clarity of contrast in particular and expository reasons in general. It is not to be reasoned that any and all economists can be classified neatly as a positivist or policy economist on an either-or basis. Indeed, most economists fall and/or fluctuate between the two.

John Neville Keynes' classic distinction between positive science, normative science, and art is extremely relevant to the ensuing discussion and provides an excellent point of departure. According to Keynes, ". . . a *positive science* may be defined as a body of systematized knowledge concerning what is; a *normative or regulative science* as a body of systematized knowledge discussing the criteria of what ought to be, and concerned therefore with the ideal as distinguished from the actual; an *art* as a system of rules for the attainment of a given end. The objective of a positive science is the investigation of *uniformities*, of a normative science the determination of *ideals*, of an art the formulation of *precepts*."[4] The concept of positive economics derived herein is closely akin to an integration of Keynes' views of positivism and art; positivism charges economists with the responsibility of deriving a systematized body of knowledge and isolating, but not recommending, rules for the achievement of stated ends concerning man's behavior in the use of scarce resources. Our definition of policy economics implies a synthesis (or simultaneous pursuit of) all three approaches with specific emphasis upon the normative role of the economist, i.e., upon his role in establishing desirable economic goals and in recommending what means ought to be employed in their attainment.

## II. POSITIVE ECONOMICS—DEFINITION, DEVELOPMENT, AND ASSUMPTIONS

Positive economics refers to the view that economics as a science is to be detached from value judgments and ideological statements (except when they can be *and* are treated as psycho-sociological facts)[5] and should deal only with the

[3] John Neville Keynes, *The Scope and Method of Political Economy* (London: MacMillan and Co., 1891), p. 31.

[4] *Ibid.*, pp. 34-35.

[5] Thus, for example, if it can be verified by statistical or other means that society embraces full employment as a desirable objective, it would be legitimate for the positivist to discover and explain the various means available for the attainment of this objective. However, he is not to recommend from among these various means nor to advocate or censure the objective itself. See pp. 156-157.

discovery, description, explanation, and consequences of universal "if-then" correlations, i.e., scientific laws, among relevant economic phenomena.

Economic positivism is in part an offshoot of the empiricist approach to the sciences.[6] As such, it emphasizes the methodological (but not necessarily "practical") identity of all sciences. With respect to the social sciences it advocates the need for greater accuracy and objectivity *via* a rigorous divorce of values and facts. Undoubtedly, the positivist approach to economics has been partially inspired by (1) the achievements of the biological and physical sciences (wherein the distinction between facts and values is more apparent) and (2) the observation of a direct relationship between quantification and empirical experimentation, on the one hand, and achievement, on the other, in virtually all fields of scientific endeavor.

Positive economics adheres to three basic postulates: (1) The methodology of the social sciences in general—and of economics in particular—is logically identical with those of the biological and physical sciences. (2) The acquisition of technical knowledge concerning the analytical tools and relevant variables of theoretical economics does not *per se* endow the economist with omnipotence as a formulator of desirable economic goals or policies; the ability to expound "the good life" is not necessarily a function of scientific prowess. (3) Economic science fulfills its correct and complete function in (a) isolating and explaining uniform patterns of behavior in the administration of scarce resources in the satisfaction of human material wants and (b) in deriving and explaining—but not recommending—means of attaining the objectives of society.

### III. POLICY ECONOMICS—DEFINITION, DEVELOPMENT, AND ASSUMPTIONS

Policy economics argues that facts and values are inextricably intertwined. The purpose and significance of economic science are a function of value judgments. The description of economic phenomena and the explanation of causal relationships between relevant economic variables contained in such phenomena cannot be practically and/or realistically distinguished from (a) the determination of criteria for measuring the social merit of such phenomena and causal relationships, (b) the establishment of pertinent objectives for "economic progress," and (c) the exploration and evaluation of means for attaining such aims.

The current widespread acceptance of the policy approach to economics undoubtedly is due in part to historical reasons. Historically, advocacy and analysis in economics were combined (freely) and, in many cases, the latter actually subordinated to the former.[7] Indeed, for many decades the social sciences in general —and economics in particular—were regarded as being synonymous with applied ethics. Society today tends to regard economics as being at least somewhat factual and technical, "while the ancient and medieval conception from which

[6] See, for example, Lange, *op. cit.*, pp. 19–23; and R. F. Harrod, "Scope and Method of Economics," *Readings in Economic Analysis*, Vol. I, ed. by Richard V. Clemence (Cambridge: Addison-Wesley Press, 1950), pp. 386–7.

[7] See, for example, Eduard Heimann, *History of Economic Doctrines* (London: Oxford University Press, 1945), p. 23; and Hla Myint, *Theories of Welfare Economics* (Cambridge: Harvard University Press, 1948), especially Chapters 1–5.

it was derived was broadly philosophical, i.e., oriented toward the whole and directed toward the discovery of a method of organizing society wisely."[8] In short, "The ideal of nineteenth-century political economy . . . aimed at the expression of ethical judgments in terms of logical classifications."[9]

In general, policy economics embraces the following assumptions: (1) The physical, biological, and social sciences are all logically and practically of a different nature. (2) The economist, by virtue of his training and background, is in a unique and advantageous position to formulate economic policy, i.e., to determine what economic objectives should be sought and what paths are most desirable to follow in the attainment of those specified goals.[10] (3) To be significant and useful economics must be of a directive nature. It is incumbent upon the economist not only to establish economic goals which society should seek, but also to outline definitively and recommend the specific courses of action society must persue to attain affectively those ends.

## IV. ANALYZING THE CONFLICTING TISSUES

Because the policy and positivist schools of thought are both more prone to develop, clarify, and improve their respective positions than they are to consider and comprehend the opposing view, an impartial survey of the major areas of conflict between the two positions is highly desirable if the two approaches are to be understood. To this end, it is of value at the outset to summarize briefly the major points of conflict.

The ensuing arguments constitute the nucleus of the positivist position. (1) Values only enter (if at all) into the selection of variables for analysis in a remote, pre-scientific, and/or relatively insignificant manner. (2) Because values (excluding psycho-sociological facts) cannot be demonstrated scientifically to be correct or incorrect (i.e., they negate an appeal to facts), their frequent and/or imprudent use might lead to chaos in the field of economics. The separation of values and facts in economics is not always a simple task, but it is at least partially feasible and most desirable. (3) From a long-run point of view the efficacy, practicality, and meaningfulness of economic science will be enhanced by a divorce of advocacy and analysis. (4) Economics cannot lay claim to being a valid and relatively precise science unless it avoids an intermingling of values and facts.

The policy economists, in supporting the position that the making of value

[8] Heimann, *op. cit.*, p. 23

[9] George Raymond Geiger, "The Place of Values in Economics," *Journal of Philosophy*, Vol. 27, June 19, 1930, p. 350. John R. Hicks has succinctly summarized this view by stating that "During the Nineteenth Century, it was generally considered to be the business of the economist, not only to explain the economic world as it is and as it has been, not only to make prognostications...about the future course of economic events, but also to lay down principles of economic policy, to say what policies are likely to be conducive to social welfare, and what policies are likely to lead to waste and impoverishment." Hicks, "The Foundations of Welfare Economics," *Economic Journal*, Vol. 49, December 1939, p. 696.

[10] For an interesting elaboration of this point see Daniel Kading, "Moral Judgments in Social Science," *Southwestern Social Science Quarterly*, Vol. 34, March 1954, pp. 19-27.

judgments by economists is not only necessary but desirable and wholly justifiable, make the following contentions. (1) The selection of problems to be explored—particularly in the social sciences—involves the application of value statements. (2) The nature of the subject matter or data of economics precludes any clear demarcation of facts and values. The fact that economics is ultimately concerned with *human* behavior (e.g., such concepts as consciousness, purposiveness, free-will, etc.) makes value implications an integral part of economics. (3) The significance and efficacy of economics is a function of the economist's obligation and ability to utilize simultaneously analysis and value judgments. (4) The validity and accuracy of economics are *not* impaired (necessarily) by the integration of facts and values. The conflicting arguments of the two positions merit more detailed consideration.

A. *The Selection of Problems Issue.* Advocates of the policy approach to economics frequently contend that economics is necessarily intermingled with values because the economist is literally forced to make judgments of a value nature in selecting problems for analysis, the variables relevant to that given problem, and in delimiting his field of inquiry.[11] Furthermore, the "scientific method" itself is virtually circumscribed by a system of ethics since it too must be subjected to evaluation of an ethical nature. That is, "since scientific methods themselves call for evaluation . . . scientific conclusions are also ethical."[12]

Positivists answer these contentions with a variety of arguments. (1) Some writers are inclined to argue that the perception of a set of related phenomena is a prescientific act, i.e., the course of any scientific study is necessarily based upon the researcher's vision and intuition in addition to the work and intuition of his predecessors.[13] This admittedly poses practical—*but not logical*—problems for the economist desirous of achieving and maintaining scientific objectivity in his analysis. It is not, however, a sufficient condition for the deterioration of economics into a branch of applied ethics. (2) Others simply contend that all sciences contain ideological elements in their formative phases and point out that ideological motivation may actually have accelerated the progress of science.[14] (3) It might also be argued that the question of relevant variables and data is a factual question. Certain variables either are or are not relevant to a particular question, relationship, or generalization; the relevance of a specified variable is

[11] See, for example, Paul Streeten, "Economics and Value Judgments," *Quarterly Journal of Economics*, Vol. 64, November 1950, pp. 585–88.

[12] See Lundberg, "Can Science Validate Ethics?," *American Association of University Professors Bulletin*, Vol. 36, Summer 1950, pp. 269–70. Lundberg, it should be noted, criticizes this view.

[13] See Joseph A. Schumpeter, "Science and Ideology," *American Economic Review*, Vol. 39, March 1949, p. 350. Friedman, *op. cit.*, p. 43, is even more explicit on this point: "The construction of hypotheses is a creative act of inspiration, intuition, invention; its essence is the vision of something new in familiar material. The process must be discussed in psychological, not logical, categories; studied in autobiographies and biographies, not treatises on scientific method; and promoted by maxim and example, not by syllogism or theorem."

[14] See Lange, "The Scope and Method of Economics," *op. cit.*, p. 24; Schumpeter, *op. cit.*, p. 350.

a factual matter which can be decided *via* an appeal to empirical evidence. (4) Still others take a more dogmatic stand in meeting the second facet of this criticism of economic positivism. They contend, first, that not all evaluation is ethical; evaluation may be objective (empirical) even with respect to the matter of scientific method. Secondly, the "ethics" or "mores" of science (as a method) and the type of understanding and explanation which is the goal of scientific method are ends which are not *per se* evolved *via* the scientific method.[15] In short, there are no laws to guide the scientist in selecting a methodology.

B. *The Nature of Economic Data Issue.* Of greater methodological significance is the policy economists' contention that the very nature of the data of economics entails an integration of values and facts. This argument has several facets.

(1) In the first place, policy economists believe that one of the basic postulates of economics—the assumption of rational, efficient, or consistent choice—necessarily entails the additional tacit assumption "that such choice is desirable, that we should set our face against waste and foolishness."[16] This implicit assumption of desirability of rational choice, it is argued, is a non-scientific evaluation of what "ought" to be, thus impairing the scientificity (in the positivist sense) of economics.

(2) Secondly, policy economists also have contended that the generalizations of economics can only be compared (meaningfully) to those of the physical sciences when the nature of the subject matter of each is identical. This is obviously not the case, it is argued, so long as such factors as free or human will are considered. In brief, consciousness, purposiveness, and free-will, it is argued, clearly delineate the social from the physical sciences and inextricably bind economics to value judgments.[17] Relationships between human—as opposed to physical—data necessarily encompass normative considerations, i.e., the social sciences cannot and should not abstract from matters of right and wrong. The economist ultimately deals with human behavior; human behavior is inevitably intermingled with ethical and moral judgments. Hence, economics is basically and necessarily a branch of applied ethics. This in turn implies a methodology of a different nature than that of the physical sciences.

(3) Thirdly, the preceding argument is reinforced by the contention that economic generalizations are only relevant and, therefore, applicable to a given institutional framework which is, by its very nature, of a transitory character. Thus economic laws are deficient in a quality necessary to the laws of any true science—that quality being universality. In broader terms, economic generalizations are viewed by policy economists as being relevant only to a specified ideological framework. Because ideologies are fundamentally value statements, economic laws are therefore dependent upon and integrated with values.[18]

[15] See Lundberg, *op. cit.*, pp. 269, 270.

[16] Streeten, *op. cit.*, p. 590.

[17] See Barbara Wooton, *Lament for Economics* (London: George Allen & Unwin, 1938), p. 125.

[18] *Ibid.*, Ch. 3, especially pp. 128–30; Lundberg, *op. cit.*, p. 269; Schumpeter, *op. cit.*, especially pp. 347–49; and Joseph J. Spengler, "Have Values a Place in Economics?," *Ethics*,

(4) In the fourth place, it has been pointed out that—even if it is admitted that values are not necessarily involved in the *manipulation* of economic concepts—such values are inextricably bound up with the given data of economics. Hence, for example, private property or the distribution of income cannot be treated dispassionately, i.e., it cannot be "accepted with the same equanimity that is accorded in the natural sciences to paramecia or quanta or catalysts."[19]

(5) Policy economists argue that the actual discovery and/or isolation of laws in economics (and the social sciences in general) destroys their validity by virtue of the possibility that knowledge of patterns of uniformity in man's behavior may *cause* him to modify such behavior, i.e., "in any sphere which is open to the intrusion of the will, the link between cause and effect is itself vulnerable."[20]

(6) Finally, the policy position contends that—apart from any theoretical possibility of separating facts from values—any clear line of demarcation in practice is virtually impossible. "Discussions of what is and what ought to be are often linked together in the closest and most intricate manner. . . ."[21] Similarly, it is argued that connections between exogenous and endogenous factors are considerable and complex and, therefore, elusive of separation and isolated analysis. As a matter of fact, policy economists argue, their interactions may be of vital interest to a given economic problem.[22]

Positivists offer a variety of arguments in defense of their position with respect to the alleged inherent integration of values and facts in economics.

(1) In the first place, positivists take the position that the desirability of "rational choice" does not imply a value statement on the part of economists.

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Vol. 44, April 1943, pp. 313–16. A closely related argument is also of considerable significance: it has been pointed out that economics is clearly unrealistic if it is content to concentrate upon *given* and *unchanging* wants as datum. As wants change and develop the question of "proper" wants must necessarily arise. This is a value question, argue the policy economists. Hence, a meaningful, i.e., dynamic, economics must deal with value standards with respect to human wants. Similarly, because individual wants are moulded by their institutional and social environment and in terms not quantitatively reflected in the price system, the collective (ethical) evaluations of society must be used to modify, supplement, and correct the "objective" operations and calculations of economic concepts (e.g., the price system). Relevant examples would be the matters of social (as opposed to individual) costs and social (as opposed to individual) revenues. See Myint, *op. cit.*, Chapter 11.

[19] Geiger, *op. cit.*, pp. 352–3. Professor Geiger's basic view is that "because the social sciences are too tainted with earth and Adam, with man and man's possessions, too humanistic..., the divorce of facts from values in such endeavors would tend to cripple their social significance and to make complete the isolation of ethics."

[20] Wooton, *op. cit.*, pp. 125–6. Boulding points out a slightly different but relevant facet of this argument by observing the "the social scientist faces a problem which normally does not bother the nonsocial scientist, in that he is himself part of the field of his investigation." See Kenneth E. Boulding, "Is Economics Necessary?," *Scientific Monthly*, Vol. 68, April 1949, p. 235.

[21] Fraser, "How Do We Want Economists to Behave?," *Economic Journal*, Vol. 42, December 1932, p. 562.

[22] *Ibid.*, p. 564. As Boulding, *op. cit.*, p. 240, has indicated: "For all the attempts of our positivists to dehumanize the science of man, a moral science it [economics] remains. Its central problem is the problem of value: and value is but a step from virtue."

The desire to (generally) use economic resources efficiently ("rationally") is in itself a pattern of uniformity in man's behavior. Such behavior stems from man's awareness of his virtually insatiable material wants and the concurrent scarcity of the economic resources (means) for satisfying these wants, i.e., from the basic nature of the economizing problem. This uniform behavior is observable and verifiable through empirical (statistical) investigation, i.e., it is a psycho-sociological fact and can thus be treated as factual data by the economist. The fact that "rational choice" is at the core of economics does not mean that the economist is passing judgment upon the desirability (or lack thereof) of such behavior. Indeed, pushing this line of thought to extremes, economists would be concerned with uniformities in the behavior of man in wastefully (inefficiently) using resources if, *as a matter of psycho-sociological fact*, man generally acted in this way. The basic facts of (a) a scarcity of economic resources and (b) virtually unlimited material wants have made such a redefinition of the subject matter of economics largely nonsensical.[23]

(2) Secondly, the positivists meet the free-will-consciousness-purposiveness issue through two closely related arguments. Some argue that, if *all* relevant physiological data were known, voluntary behavior would be scientifically predictable, i.e., subject to the generalizations of the social sciences.[24] Others believe that the policy economists' freewill or "voluntary behavior" argument is circumvented by any science which, as such, merely presupposes that such behavior is subject to observation and hence scientific analysis, prediction, and control as are the behavior of physical and/or biological data.[25] More specifically and in terms of the subject matter of economics, it has been pointed out that any distinction between "economic forces" and "human behavior" is "an entirely imaginary antithesis. Man is a part of nature; economic science is a part of the study of human conduct, and its 'laws' are generalized statements about the behavior of human beings."[26] As for the "unpredictability" of human behavior

[23] To the present writer it is at least logically feasible that the economizing problem could be reversed. For example, if economic resources were so abundant relative to human material wants that oversatisfaction of these wants resulted in social, ethical and/or cultural degradation, the economist (or "diseconomist") would then be concerned with the discovery and explanation of uniformities in patterns of behavior concerning wasteful (inefficient) uses for resources. This rests, of course, on the assumption that (as a psycho-sociological fact) society has deemed it desirable to avoid the degradation of society by using resources inefficiently! See also the excellent discussion of A. G. Papandreou relative to the question of rational choice as a basic postulate of economics in "Economics and the Social Sciences," *Economic Journal*, Vol. 60, Dec. 1950, pp. 717–19.

[24] See Gustav Bergmann, "An Empiricist's System of the Sciences," *Scientific Monthly*, Vol. 59, August 1944, pp. 146–48. In short, the behavioral and biological sciences are (in principle) ultimately reducible to the laws of the physical sciences *if* all relevant data can be isolated with respect to behavior and biological sciences. This, of course, implies the philosophical conflict between "vitalism" and "determinism" or "mechanism."

[25] *Ibid.* See Werner Hochwald, "Collective Bargaining and Economic Theory," *Southern Economic Journal*, Vol. 43, Jan. 1947, pp. 228–46, for an interesting application of this point of view to the field of collective bargaining.

[26] Dennis H. Robertson, "Wage-Grumbles," in *Readings in the Theory of Income Distribution*, ed. by William Fellner and Bernard F. Haley (Philadelphia: The Blakiston Co., 1946), pp. 221–22.

(because of freewill), positivists simply recognize that economic generalizations are less precise quantitatively and subject to more exceptions than the laws of the biological or physical sciences because of (a) differences in the number and remoteness of relevant variables, (b) the inability of the economist to conduct experiments under the closely controlled conditions of a laboratory,[27] and (c) the fact that the economist is dealing with human—as opposed to inorganic—data. This constitutes, it is argued, a *practical* but not *logical* distinction between the generalizations of the physical and behavioral sciences.[28]

(3) Similarly, the policy economists' argument that institutional relativism destroys the general applicability and hence scientific basis of economic generalizations has been attacked by positive economists. The positivists point out that any law—be it a physical, biological, or behavioral generalization—is only valid when the implicit and explicit assumptions upon which the law is constructed are present. In other words, *all* laws are tentative or conditional statements of uniformities (usually "if-then" correlations) which are "universal" in applicability only when postulated prerequisite conditions are (or could be) realized. The failure of such conditions to be fulfilled in actual application destroys the precision and/or validity of the generalization. This is equally true of the laws of any discipline.[29] Hence, the laws of mechanics are only universally valid (in a strict sense) when the controlled conditions of the physics laboratory are fulfilled. In other words, "universality" is in and of itself a relative term in so far as the application of scientific generalizations is concerned. Admittedly, certain economic laws may be more limited in the applicability than the laws of physics because of the complicating factor of institutional relativism; however, this is a matter of degree, according to the positivists, and not of kind.[30] It must also be noted that analytical (theoretical) economics embraces a rather broad range of topics which are largely divorced from any ideological framework and, hence, independent of values. Furthermore, there apparently exists a direct relationship between the development of analytical tools and the extensiveness of this ideology-free sphere in economics.[31]

[27] See Friedman, *op. cit.*, pp. 10, 39–43. Professor Friedman has argued that "The inability to conduct so-called 'controlled experiments' does not...reflect a basic difference between the social and physical sciences both because it is not peculiar to the social sciences—witness astronomy—and because the distinction between a controlled experiment and uncontrolled experience is at best one of degree. No experiment can be completely controlled, and every experience is partly controlled, in the sense that some disturbing influences are relatively constant in the course of it." See also Boulding, *op. cit.*; Spengler, *op. cit.*, pp. 313–16.

[28] See Bergmann, *op. cit.*, pp. 140–48.

[29] See Lange, *op. cit.*, p. 20.

[30] Positivists are careful to emphasize that laws need not be entirely precise to be meaningful and useful. As Friedman has indicated, the ultimate test of the usefulness of any scientific theory or hypothesis is: "Does it work?," i.e., does it function as a reasonably accurate predictive device? *Op. cit.*, pp. 16–18, 30.

[31] See Schumpeter, *op. cit.*, p. 352. Schumpeter points out that it does not follow from the mere presence of ideological elements in an economist's approach to his field that his analysis and conclusions will be seriously impaired in the sense of being biassed. See Schumpeter's interesting comparison of the ideological backgrounds of Adam Smith, Karl Marx, and John Maynard Keynes. *Ibid.*, pp. 352–56.

(4) Relative to the policy economists' contention that economic data (e.g., private property, income distribution) cannot be viewed "dispassionately" as allegedly can the data of physical and biological sciences, positivists contend that this argument is irrelevant and misguided. It is merely a practical—as opposed to a logical—problem with which the social scientist must constantly contend. Indeed, it exemplifies why social scientists must be careful of their methodology in order to avoid nonobjectivity in their analyses. Economists, according to the positivists, are obligated to treat private property as a factual matter and should not, as economists, judge upon the morality of such an institution. Private property is a given datum; it is observable and verifiable. It is a matter of fact and not a matter which necessarily projects economic analysis into the realm of ethics.

(5) The argument that the isolation of generalizations in a behavioral science will affect the uniformity of that behavior has also been subject to the scrutiny of economic positivism. Positivists would simply take the position that economic generalizations would be subject to qualification and/or modification which in all probability would improve their accuracy and add an element of realism, although their universality might be somewhat impaired. The fact that such behavioral adjustments in response to the isolation and comprehension of an economic law are observable permits such modifications.

(6) Finally, in meeting the final point offered by the policy economists, the positivists are a bit more compromising. While acknowledging the *practical* problems involved in separating facts and values in analyzing a practical economic problem, they staunchly defend the desirability of such a separation and reemphasize the theoretical possibility of doing so. Accuracy, objectivity, and validity, they argue, are the rewards of such an undertaking. (See also pp. 158–159.)

C. *The Issue of Usefulness.* Though basically divergent the respective positions of the positivists and the policy economists on the first two issues are relatively clear. In contrast, the policy contention that the significance and usefulness of economics depends upon the willingness and ability of the economist to successfully combine analysis with advocacy and the countering arguments of the positivists are surrounded by vagueness and a considerable measure of confusion.

Policy economics embraces the view that "Economists cannot and should not refrain from making value judgments if their studies are to be more than a purely formal technique of reasoning, an algebra of choice . . . it is neither possible nor desirable to do without value judgments in economics."[9] Most policy economists take an allegedly practical stand in supporting their view and contend that the mere analysis of economic data and phenomena unaccompanied by value judg-

[9] Streeten, *op. cit.*, pp. 595, 584; also see Fraser, *op. cit.*, p. 570. Several writers who advocate the policy approach feel that the economists should make value judgments because of their greater knowledge and better perspective on a given problem. "While it [ethics] must attempt to grasp the significant findings of other studies, it cannot be expected...to delve into the technical and often dismal details of economics." Geiger, *op. cit.*, p. 353. See also Kading, *op. cit.*, especially pp. 21–22, and Spengler, *op. cit.*, pp. 316 ff.

ments and policy recommendations virtually robs the subject of its significance and efficacy. Analysis is meaningful only when accompanied by advocacy; any divorce of the two is unrealistic and contributory to the sterilization and/or euthanasia of economics as a useful field of knowledge. For example, Lindley M. Fraser, in a biting criticism of the positivist's position, has argued that

> If they [economists] are to help the community to solve its problems, they themselves must be counsellors and advocates, perhaps also administrators and statesmen. For the adequate fulfillment of this task they may have to equip themselves with elaborate analytical technique. But to believe that this technique is the essence of economics, or that because economists ought to reason scientifically, therefore they ought to do no more than reason scientifically, is to mistake the means for the end . . . .[33]

Similarly, Hla Myint has gone so far as to suggest that an excellent means for the maintenance of scientific impartiality in economics is "to make deliberate and uninhibited value judgments and to use them as a basis of self-criticism in our purely scientific analysis." It is only through practical application and the realm of practical social policy, according to Myint, that economic theory can justify its existence.[34] Professor J. R. Hicks has endorsed the policy view in even more dramatic terms: ". . . it is a dreadful thing to have to accept . . . economic positivism might easily become an excuse for the shirking of live issues, very conducive to the euthanasia of our science."[35] A parallel argument takes the position that the linking of theory and practical application (policy) encourages the economist to channel his efforts toward more significant (i.e., "practical") problems.[36]

Positive economists have attempted to discount this position in a variety of ways. In general, positivists argue that one must accept an extremely limited view of the role of the scientist in society in order to contend that he is acting in a useful and significant manner only when combining scientific analysis with policy-making. For example, the scientists responsible for the discovery and development of atomic energy have undoubtedly played a significant and (it is to be hoped) fruitful role in determining the future course of modern civilization. Yet this significance is not contingent upon their opinions as to the desirability (or lack thereof) of atomic explosions. In other words, the economist is extremely useful (as is any other expert in his field) in discovering certain laws among economic phenomena, even though political and/or other officials (and ultimately the "public" in a democracy) may determine the policy decisions to be made on the basis of these laws.[37]

Professor Milton Friedman is illuminating with respect to the positivists' position concerning the issue of usefulness. He is of the opinion that differences on issues of economic policy reflect a multiplicity of predictions with respect to the economic consequences of given actions. It is only through the development

[33] Fraser, *op. cit.*, pp. 569–70.

[34] Myint, *op. cit.*, p. 235.

[35] Hicks, *op. cit.*, pp. 606–7; see also Wooton, *op. cit.*, Ch. 6.

[36] On this point see Keynes, *op. cit.*, p. 54.

[37] Or, alternatively, the economist plays a useful function in implementing the value judgments (goals) of society. See Lundberg, *op. cit.*, pp. 263–4.

of positive economics, according to Friedman, that such differences can be resolved.[39] In this way economics can be expected to yield more reliable and more widely acceptable conclusions. Such an improvement, it is argued, is obviously conducive to a more practical and useful economics.

Contrary to the opinion of many critics of economics as a science,[40] Friedman makes the often overlooked but extremely significant contention that the usefulness or practicality of positivist theories or hypotheses does not depend upon their accuracy in *describing* the actions of economic units but rather upon the precision and accuracy of the predictions derived from these theories.[41] Thus, for example, a theory is valid and useful if it tells us that businessmen behave *as if* they were attempting to maximize profits, "*as if* . . . they knew the relevant cost and demand functions, calculated marginal cost and marginal revenue from all actions open to them, and pushed each line of action to the point at which the relevant marginal cost and marginal revenue were equal."[42] In other words, the fact that successful businessmen do not actually make such calculations does not render the theory (of marginalism) irrelevant, meaningless, and void of practicality or usefulness. Its justification and usefulness stem from the fact that businessmen who do not act in some manner consistent with or akin to this maximization objective will simply not survive.[43] Hence, the usefulness, for example, of marginalism in economics must be judged on the basis of its predictive accuracy and not on the criterion as to whether or not it constitutes a detailed *description* of *how* the businessman makes his pricing and output decisions. In short, the "realism" and "usefulness" (in the sense of providing an accurate description of "what is") of economic hypotheses are, in a sense, an inverse function of the discrepancy between actual and predicted behavior. "Descriptive accuracy" and "analytical relevance" are distinct concepts; it is argued by the positivists that the latter is a more meaningful gauge in measuring the usefulness or practicality of a scientific theory.

D. *The Accuracy Issue.* With respect to the issue of accuracy in economics one finds the positivists taking the offense and the policy economists reluctantly assuming the defensive.

On this issue policy economists simply indicate that the "proper" use of value judgments need not inject biasses nor inaccuracies into economics: the objective of unprejudiced thinking is not to sidestep value judgments but to isolate them and bring them into the open. Policy economists believe that conclusions are biassed primarily because premises are not made explicit and not because they follow from political, moral, or ethical judgments. Arguments are inconclusive or biassed "whenever value judgments are disguised as factual propositions

[39] Friedman, *op. cit.*, pp. 5-6. Also see Lange, *op. cit.*, pp. 22-23.

[40] For example, Wooton, *op. cit.*

[41] See footnote 25 and Friedman, *op. cit.*, pp. 15, 16-23.

[42] *Ibid.*, pp. 21-22.

[43] *Ibid.*, p. 22. "A theory or its 'assumptions' cannot possibly be thoroughly 'realistic' in the immediate descriptive sense so often assigned to this term" (p. 32).

[i.e., are ideological statements][43] or when they are suppressed altogether. . . ."[44] In other words, explicit value judgments recognized as such *can* be consistent with the derivation of scientific, unbiassed conclusions. Economists are urged, however, to examine their value judgments and the assumptions stemming from and contained within them in the light of their acceptability in terms of social reality and to eliminate any conflicts and/or ambiguities in these value issues.

The positivists have launched a threefold attack on the policy position with respect to the issue of accuracy. (1) For the most part, values are not matters of fact; therefore, they cannot be proven or disproven via appeal to empirical data. Rules of conduct or guides to action based upon an admixture of advocacy and analysis are thus conducive to irreconcilable dispute. Thus, it is concluded, disagreement between economists as to the validity of a given set of value judgments in relation to non-economic (ethical) or cultural standards might lead to utter confusion within the field itself. Facts are essentially interpersonal (can be observed by everyone); values are intrapersonal (differ among individuals). In particular, disagreement with respect to social objectives would be a basic cause of confusion and chaos under the policy approach. Admittedly, much of this confusion could be eliminated or mitigated *if* value statements could be recognized and clearly labeled as such. However, this is frequently not the case.[45]

(2) The positivists also argue that the policy approach becomes untenable and internally inconsistent when the question of whose values should be adopted in considering a specific problem or issue arises. Policy advocates allege that economists should make value judgments since they do have "*one* of the qualifications for [moral] expertness, i.e., knowledge of relevant data. . . ."[46] Economics is a complex, intricate field of study; only the expert can be expected to have sufficient knowledge and perspective to make enlightened value judgments with respect to its goals and means. Indeed, it is argued that many significant economic questions (which would be ignored in the positivist approach) would be foreign to and hence also ignored by moral philosophers, politicians, and social scientists in related disciplines.[47] The economist should actively employ his unique and advantageous position in the formulation of economic policy.

Positivists counter this argument with the claim that the acquisition of technical knowledge concerning the analytical tools of theoretical economics does not *per se* endow the economist with omnipotence as a formulator of "desirable" economic policies. There is no *logical* reason why the values of social scientists are to be weighed more heavily in policy-making or in the establishment of

[43] Gustav Bergmann, "Ideology," *Ethics*, Vol. 61, April 1951, p. 210; Streeten, *op. cit.*, p. 585.

[44] Streeten, *op. cit.*, p. 585.

[45] Lange, *op. cit.*, p. 22.

[46] Kading, *op. cit.*, p. 21. See also Spengler, *op. cit.*, p. 319.

[47] Fraser, *op. cit.*, p. 566, argues that such significant problems as "the desirability of equalizing incomes or abolishing private property. . . [or] the advantages and disadvantages of organizing the economy on a communist of co-operative basis" would escape consideration and intelligent solution under the positivist approach to economics.

"economic objectives" than those of nonscientists.[45] This is particularly so because the practical implications of (say) a so-called "economic policy decision" will obviously have widespread noneconomic,—i.e., social, political, and psychological—repercussions. Such multidisciplinary ramifications pose the delicate question as to whether the economist, sociologist, political scientist or psychologist, for example, is to be given ultimate decision-making authority concerning the "economic question" of (say) income (re)distribution or private property. How is the policy economist to answer this query without becoming more deeply entwined in a maze of value judgments? In short, argue the positivists, does not the policy economist's proclivity to endow the economist with policy-making power force such advocates into the embarrassing position of having to make a value statement relative to the worth of the values held by economists? In somewhat less negative terms, the positivists feel that after the individuals and institutions comprising a society (or those delegated the authority to make decisions for society) have postulated what is considered to be (ethically) desirable "economic goals," it is the role of the economist to isolate alternative means of implementing this program, i.e., of attaining those goals. It is also the economist's function, as the positivists see it, to state the consequences (i.e., costs, effectiveness, etc.) of each means of realizing the given objectives; but not to determine the objectives themselves.[46] Or, alternatively, it is the task of the economist to discover, isolate, and explain correlations of functional relationships among economic phenomena apart from any stated societal objectives.

Positivists believe that the ability to expound "the good life" is not necessarily a function of scientific training. Whether or not the economist has better perspective for policy-making is in itself a value question and, hence, not subject to scientific determination. The policy economist, it is argued by the positivists, finds himself in the unenviable position of resting his case upon the specific value judgment that the value judgments of social scientists are somehow superior to those of laymen, politicians, etc. In effect, the positivists are suggesting that it would be a preferable expedient—and a more intelligent division of labor—to assign the role of policy-maker to the politician, statesman, or moral philosopher who is in a somewhat more advantageous position to survey mass sentiments and act accordingly. Such a separation of advocacy and analysis, it is argued, would be contributory to the maintenance of scientific objectivity and, hence, accuracy in the social sciences, and simultaneously would avoid the implicit policy assumption that the economist has omnipotency in ethical spheres.

(3) As already indicated, policy economics rests its case in part on the practical difficulties involved in distinguishing between factual and value statements.

[45] As Lionel Robbins, *An Essay on the Nature and Significance of Economic Science* (London: MacMillan and Co., 1937, 2nd ed.), p. 147, has argued: "Economics is neutral as between ends. Economics cannot pronounce on the validity of ultimate judgments of value." See also Lundberg, *op. cit.*, especially pp. 265–67.

[46] See Lundberg, *op. cit.*, pp. 263–4. Needless to say, this is not a denial of the fact that economic activity (i.e., the "datum" of economic science) is influenced by ethical and moral considerations. See Keynes, *op. cit.*, pp. 40–41, 45.

Positivists have seized upon this contention and used it in bolstering their position by arguing that in accepting the argument that in practice facts and values are indistinguishable scientific precision is impaired. That is, positivism obviously stresses that value judgments and scientific analysis are to be separate and distinct. Advocacy and analysis are to be divorced. This almost automatically eliminates any confusions in scientific analysis which may arise from a failure to distinguish between facts and values. The positivists think that an objective social science is inconceivable if we fail to make this separation as clear as is possible. Policy economics, however, is prone to bestow both the right of analysis and the obligation of advocacy upon the social scientist. Admittedly, it is difficult for both the policy economist and the positive economist to distinguish between facts and values in practice. The former, however, is not particularly obligated to attempt to make a distinction between the two because his philosophy permits him to deal freely in both; by the very nature of his philosophy the latter is commanded to fetter out vigorously values and only to examine and manipulate empirically verifiable factual data.

If the preceding comments are at all accurate, does it not follow, argue the positivists, that the policy economist is more prone to confuse fact and values than is the positivist?[50] Specifically, the very nature of policy economics exposes economics to the dangers inherent in a failure to distinguish between what might be termed "statements of psycho-sociological fact" and "ideological statements." A psycho-sociological fact may be defined as an empirically observable and/or testable statement regarding human attitudes, opinions, or actions, i.e., a verifiable statement concerning conscious, human behavior. Such a statement—so argue the positivists—is factual. People either do or do not act in accordance with the stated generalization. Thus a statement of psycho-sociological fact is either correct or incorrect; it is either true or false and can be so proven by empirical investigation. An ideological statement, on the other hand, can be defined as "a value judgment disguised as, or mistaken for, a statement of fact. . . ."[51] Because it is in the final analysis a value judgment, it is neither valid nor invalid in the scientific sense. It cannot be proven true or false through an appeal to empirical evidence. If the economist is given free reign to mix advocacy and analysis, is it not possible—indeed, is it not likely—that he will imprudently come to confuse ideological statements with statements of psycho-sociological fact? Positivists fear that, if this is even a remote possibility, one can envision a fusion of economics and ethics which could conceivably reduce the former to a status comparable to that of astrology or phrenology.[52] If economics is to gain prestige *as a science*, economists must seek to resist not only the motivational pressures inherent in ideological statements but also the potential deterioration of objectivity stemming therefrom.

[50] For example, see Keynes, *op. cit.*, p. 47, and Schumpeter, *op. cit.*, p. 346.

[51] Bergmann, *op. cit.*, p. 210. Similarly, Oskar Lange has defined ideologies as "...systems of beliefs which are not held on grounds of their conformity to scientific procedure but as rationalizations of subconscious, non-logical, motives." Lange, *op. cit.*, p. 23.

[52] See Schumpeter, *op. cit.*, p. 358.

## V. SOME FACTORS UNDERLYING THE CONFLICT

It is hoped that the preceding discussion constitutes a relatively impartial survey of the positivist and policy approaches to economics. Let us now consider by way of summary some of the reasons underlying the breach between the two basic positions. In other words, it is implicit in the foregoing discussion that certain important causal factors have given rise to the alignment of great minds on both sides of the issue of economic methodology. What might some of these factors be? Even more basic is the related question: Are these two approaches to economics as diametrically opposed to one another as current writing in the field would lead us to believe?

It is suggested that the following factors have accounted for a significant portion of methodological controversy in economics:

(1) Positivists seem to be more concerned with the long-run consequences of methodology in economics than are policy economists. The former fear the demise of economics as a science over time if a course of action permissive of the free integration of facts and values is adopted widely. Policy economists couch their arguments in terms of the immediate or short-run practical accomplishments of economics when the economist assumes the role of counsellor, advocate, or policy-maker in addition to that of analytical scientist. The explicit mutual recognition of this difference in the time dimension by the two schools of thought might be conducive to the amelioration or elimination of certain points of conflict, e.g., some of these points of conflict relating to the issue of usefulness.

(2) Closely related to the preceding point is the implicit disagreement of the two approaches as to the meanings of the terms "practical" and "realistic" as applied to economics. To the policy economists "practical" is virtually synonymous with the establishment of guides to action and policy decisions which are judged to be in accord with the public (general) welfare. "Realistic" implies usefulness or "of a directive nature." To the positivist "practical" is akin to accuracy, clarity, and quantitative precision; "realistic" is couched in terms of ability to predict actual (future) events upon the basis of scientifically derived statements of uniformity among economic data.

(3) Obviously, there is a conflict between the policy and positivist understanding of economic laws. Policy economists tend to accept economic laws as relatively unprecise generalizations of a more-or-less transitory nature, partly because of their dependency upon a given institutional-ideological context. Such laws may encompass conditions (assumptions) or conclusions of a directive or value nature. To the positivists economic laws are "if-then" correlations divorced from matter of "ought." These laws are universally valid (regardless of institutional-ideological structure) so long as prerequisite conditions are fulfilled. Policy directives denote a post-scientific extension or addendum to economic laws. A mixture of the two, however, leads to the deterioration of both.

(4) The policy and positivist approaches also differ with respect to the scope or coverage of economic science. Positivists, as we have seen, presuppose a narrow scope for economics as a science. In this view, economic laws provide a de-

tached, impartial statement of uniform (but conditional) patterns of behavior in the administering of scarce resources. Economic theories or models simply explain the connections or uniformities between such laws. Such laws and theories derive their usefulness from the fact that they entail the ability to predict the consequences of economic behavior. The institutional-ideological framework and accompanying social objectives are factual data and constitute the context within which patterns of uniformity in economic behavior are to be discerned. Changes in this framework command the economic scientist to reformulate and modify his laws and theories; it is not the economist's task as a scientist, however, to pass judgment upon the desirability of such institutional ideological changes.

The policy approach encompasses a wider sphere of coverage. As a general rule, policy economists feel that economics is concerned not only with patterns of uniformity in economic behavior but also with (a) establishing and evaluating rules or guides for policy relevant to such uniformities, (b) comparing, explaining and evaluating varying institutional-ideological contexts, and (c) explaining and evaluating the desirability of changes in such a framework along with possible implications for patterns of economic behavior. In short, policy economists are somewhat more willing to embrace not only theoretical or analytical economics but also the fields of applied and institutional economics as a part of economic science. Positivists, on the other hand, are usually inclined to recognize the latter two areas as being quasi-scientific because of their policy (value) connotations.

(5) Furthermore, it should be noted that the broadening and changing scope and direction of economic inquiry undoubtedly has proved a thorn in the side of any potential amelioration of the breach between the policy and positivist philosophies. As the techniques of economic science expand and become increasingly refined, specialization or greater division of labor for economists is a more-or-less natural concomitant. It follows that many of the branches of economic science elude not only the comprehension of the general public but also the understanding of the economic specialist himself. As an outgrowth of this one might find, for example, the specialist in (say) public finance and fiscal policy adopting the policy approach while the pricing and distribution specialist accepts economic positivism. Each specialist might thus fail to accept and/or recognize the methodology of the other primarily because of a failure to completely understand the subject matter and scope of the other's field of specialization.

This implies that it might be wise—as a tentative proposition—to accept (on a pre-scientific basis) methodology in economics as a technique whose validity is a relative thing, i.e., dependent upon a combination of such factors as (a) the branch of economics[12] under discussion, (b) the nature of the specific subject matter or problem within that branch, (c) the personal characteristics or traits of the economist, and (d) even the context or environment within which he is working. All such factors may be relevant to the adoption of an appropriate methodology for the issue at hand. Economic research in a context devoid of the

[12] The term "economics" is used here in a generic sense to include theoretical or analytical economics, welfare economics, applied economics, economic history, the various brands of institutional economics, etc.

bias which is apt to accompany advocacy undoubtedly would be palatable to many positivists; it is basically the "affiliated" economist whose conclusions—regardless of the problem at hand—are (nonscientifically) predetermined by the interest group which sustains him that disturbs the sleep of the devout positivist. Similarly, there is little doubt that most policy economists have a more or less inherent respect for the positivist; indeed, his interest in truth apart from the controversies surrounding economic policy may serve as an implicit check upon the policy economist, injecting a needed element of caution and restraint into the policy school of thought.[54] The judgments of the economist who leans toward positivism often contain a preciseness and clarity lacking in those of the economist who stands ready to evaluate and advocate with respect to any and all policy issues.

On the other hand, there can be but little doubt that the activities of affiliated or partisan economists have indirectly and/or unintentionally made a contribution[55] to the development of economic science. Such economists frequently perform yeoman's service in isolating and delineating new issues or problems significant for economics. Although their commentaries may frequently be long on bias and short on accuracy, they are nevertheless useful in spotlighting new issues. The current spadework of business- and labor-affiliated economists on the guaranteed annual wage[56] provides an excellent illustration; they have helped provide an important (although distorted) framework ripe for more definitive and objective analysis by the unaffiliated positivist and/or policy economist. On a more intellectually respectable plane, the fact cannot be ignored that the partisan interest in policy of innumerable unaffiliated economists—past and present—has abetted the development of a great deal of useful work in the field of economics. Similarly, the position that many of the basic issues in economics (e.g. a gradually rising price level versus an occasional recession or continued concentration of economic power versus a return to competition) are so intertwined with the technical aspects of economic analysis that only economists are

[54] A contrast of the attitudes of economists and other scientists (say physicians) relative to the latest achievements in their respective fields reveals a rather appalling divergence. The former frequently revel in overextended claims as to the significance of their accomplishments and encourage—or at least fail to suppress—widespread publicity concerning their findings, despite the fact that results and supporting evidence may be anything but conclusive. In contrast, medical doctors display extreme caution in the proclamation and publicizing of their findings until evidence in support of their discovery is clearly decisive. This proclivity on the part of many economists to exercise prematurely their zeal for advocacy contributes to public misunderstanding and prompts the deterioration of the cautious, conservative attitude prerequisite to the steady advancement of any science.

[55] Whether or not this is a "net" contribution is subject to debate.

[56] See and compare Emerson P. Schmidt, "The Guaranteed Wage—1954 Model," *Michigan Business Review*, Vol. 6, July 1, 1954, pp. 1–7; Chamber of Commerce of the United States, *The Economics of the Guaranteed Wage* (Washington, D. C., 1953); National Association of Manufacturers, *The Guaranteed Annual Wage and its Implications to a Free Society* (New York, 1955); Nat Weinberg, "The Thinking Behind the UAW-CIO Guaranteed Employment Plan," *Michigan Business Review*, Vol. 7, March 1955, pp. 1–8; UAW-CIO Education Department, *Questions and Answers About the UAW-CIO Guaranteed Employment Plan* (Detroit, Michigan, no date).

peculiarly equipped to discuss and evaluate them is a weighty one. This is particularly so if certain safeguards for objectivity are present. The related point that economics as a science tends to lag behind the stream of events if positivism completely dominates the science is not without merit.

The entire question of advocacy versus analysis in economics may be a variation of the resource allocation problem. It is reasonable to expect that some balance in the allocation of economists between policy and positive economics and the various hybrids thereof will lead to an optimum rate of development in economics itself. At least it is evident that ". . . economics is far too vital a field of study to cast into a single mould."[57] Ironically, economics as a science may be dragging its heels as a result of the failure to recognize and solve the allocative problem in its own ranks.

In any event the temporary acceptance of methodological relativism as a practical, pre-scientific guide in the selection of a methodology appropriate to a given branch of economics might (a) result in the disappearance or mitigation over time of certain of the conflicting issues which currently distinguish policy economics from economic positivism[58] and (b) provide a first approximation in solving the problem of efficiently allocating economic scientists. At least it merits further exploration.

Implicit in the preceding points is the possibility that a greater understanding of the two positions, the major issues of conflict, and some of the causes for the discrepancies between economic positivism and policy economics might conceivably precipitate a rational integration or synthesis of the two views or at least a considerable bridging of the current breach. Needless to say, this could only be anticipated as a long-run possibility.

Finally, let it be noted that policy economics obviously encompasses a bias toward immediate or short-run appeal to both the layman and the economist. It is practical; it states directives or guides to action; it gets results. This appeal must be carefully weighed against the long-run virtues of economic positivism. The route of progress in economics has been halting and arduous. A retracing of steps precipitated by the blind, hasty, and, therefore, inappropriate adoption or rejection of either methodology in examining a particular segment of the vast field of inquiry termed economics must be avoided at all costs.

[57] Edwin E. Witte, "Institutional Economics as Seen by an Institutional Economist," *Southern Economic Journal*, Vol. 21, October 1954, p. 140.

[58] This seems entirely consistent with A. G. Papandreou's interesting appeal for economists to "extricate ourselves from the shackles of economic universalism and experiment with less general but often more useful constructions." See Papandreou, *op. cit.*, pp. 722–23.

# ALUMINUM—A DILEMMA FOR ANTITRUST AIMS?*

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## I. INTRODUCTION

The problem for Government policy in antitrust prosecution has often been posed as a dilemma involving a choice between two desirable objectives. Allocation of resources in the interest of efficiency requires an effective degree of price competition which is dependent on the existence of many sellers, no one of which can exercise a perceptible influence on market price. Yet modern industrial nations contain within their economic fabric activities which can be performed most efficiently by enterprise of great size. Since markets for industries characterized by increasing returns to scale are often insufficient to sustain a large number of Gargantuan firms, elements of monopoly emerge within these areas. Government policy, therefore, becomes impaled on the horns of a dilemma, i.e., whether to preserve efficiency within a firm at the expense of a socially more efficient allocation of resources, or to sacrifice efficiency in individual cases in the interest of competition.[1] But must economists concede the necessity for this choice?

This paper explores the question mainly as it relates to the aluminum industry. It is appropriate to suggest, however, that the problem analyzed is not restricted to the aluminum industry. The conclusions of this paper, therefore, have implications also for other industries in which parallels with the aluminum case exist.

## II. BACKGROUND OF THE PROBLEM

Three stages are required in the production of aluminum: (1) the chemical refining of ore (alumina) from bauxite, (2) electrolytic reduction of alumina to metallic aluminum, and (3) the fabrication of aluminum into industrial shapes and forms and into end items for ultimate consumption. Given the present organization of the industry, three factors are of primary importance in the production of aluminum: (1) sources of aluminum bearing ore, (2) a commercially feasible process for extracting alumina, and (3) large blocks of inexpensive electrical energy.

In the early history of the aluminum industry an additional indispensable requirement involved the possession of patents, or license under patents, legally entitling the owners to produce virgin aluminum commercially. This explains in large part why, during the first fifty years of its history, the history of the Aluminum Company of America represents substantially the history of the do-

*The views expressed are those of the author and should not be considered as representing the views of the TVA. The author is, nevertheless, indebted to John Peterson of the Government Relations and Economics Staff of TVA for his many valuable suggestions on an earlier draft of this paper.

[1] Adams, Levit and Martin, "The Dilemma of Anti-Trust Aims," *American Economic Review*, December 1952.

mestic aluminum industry. In 1889, Alcoa, then called the Pittsburgh Reduction Company, acquired the Hall patents, and later (1903) exclusive license under the Bradley patents which permitted it to employ an advance in technique covered by the latter. Between 1903 and 1909, the expiration date of the Bradley patent, Alcoa alone was able to produce aluminum commercially without patent infringement and until that time, it alone was technically competent to do so.

During the early period of its history Alcoa developed an effectively organized, highly integrated operation. It owned bauxite deposits, transportation facilities, ore refining plants, power plants, reduction mills and the fabricating facilities required to process virgin metal into marketable end products. This process of acquisition, expansion, and integration continued into the 1930's.

The emergence and survival of Alcoa as the exclusive producer of primary aluminum excited the interest of the Department of Justice—an interest of which it gave evidence by a petition filed in 1937 charging Alcoa with "monopolizing the interstate and foreign commerce, especially in the production and sale of virgin aluminum." After two years of litigation, the case was decided in favor of Alcoa and dismissed by Judge Caffey (July 1942).[2]

On appeal by the Government, Judge Learned Hand reversed in large part the findings of Judge Caffey. Petition for relief by the Government was deferred at the time, however, pending disposal of the wartime Government constructed aluminum facilities. The Surplus Property Act of 1944 had directed that such facilities be used to promote competition. In view of the subsequent sale of these facilities to Reynolds Metals Company and Kaiser Aluminum and Chemical Company, Alcoa's production and market position was substantially altered. From a prewar position of virtually complete monopoly in the production of primary aluminum and 67–99 per cent of the domestic market, Alcoa's capacity and market position was reduced to approximately 50 per cent of the industry's total.[3] Accordingly, Alcoa contended that the Government's subsequent petition for divestiture was no longer an appropriate nor necessary remedy, an opinion with which Judge Knox concurred.[4] Both from the standpoint of national security and from the standpoint of the peacetime welfare of the public, Judge Knox opined, "The vertical divestiture of an integrated concern . . . would be, in its nature, a highly speculative—and even hazardous—venture."[5]

Following the Government's disposal program and the court decision, the industry was altered from a two to a three-producer industry. Only one additional producer, Kaiser, ". . . of substantial enough size and integration to compete effectively with the undiminished monopolist . . ."[6] had entered the field to alter the market from a duopolistic to an oligopolistic structure.[7] This is es-

[2] 44 Federal Supplement 97.

[3] 91 Federal Supplement No. 3, pp. 350 and 360.

[4] *Ibid.*, p. 416.

[5] Cf. section V below.

[6] Walter Adams, "The Aluminum Case: Legal Victory—Economic Defeat," *American Economic Review*, December 1952.

[7] Reynolds entered the primary aluminum field during 1941 with construction of ore refining, reduction and fabricating facilities; hence Kaiser alone represented a new firm in the industry.

sentially how things remained until the recent expansion program—the outcome of which remains doubtful insofar as the question of monopoly in the industry is concerned.

### III. IMPLICATIONS OF DISPOSAL PROGRAM FOR FUTURE COMPETITION

The manifold expansion of aluminum capacity during World War II was accomplished principally by the Government's construction program. This program left the Government in possession of 52 per cent of the alumina capacity, 58 per cent of the reduction capacity, and 40 per cent of the sheet, plate, and strip fabricating capacity. Directed to sell these facilities so as to foster competition, and confronted with an existing firm of enormous size and degree of integration, the Government employed these facilities to create competitors of equivalent size and integration.

Underlying the rationale of this program was the assumption that competition could not develop in the industry unless alumina were available to new firms independently of Alcoa. This assumption led to the belief that only integrated firms could compete, and a policy was therefore adopted which led to the creation of large completely integrated competitors. This decision seriously limited the number of new entrants since only two alumina plants were available for disposal. Kaiser obtained alumina capacity of approximately 700,000 tons per year, vastly exceeding the requirements of its 130,000 ton reduction capacity. Reynolds likewise, although already an integrated producer, obtained a set of completely integrated operations with alumina capacity far exceeding its requirements.[8]

It is doubtful if those expecting a competitive industry to emerge as result of the Government's disposal program took comfort in the creation of one additional producer. Certainly from the standpoint of alternatives which could have been considered, the results achieved were less than gratifying. Existence of but three producers in the field provides an excellent environment in which the Chamberlinian situation of a "recognized mutual dependence" is realized, and although the producers may act as independent entities, the results remain the same as though restrictive agreements were adhered to by them.[9]

It was not realistic to assume that the new market structure created by the Government's disposal program would have promoted anything approaching competitive behavior on the part of the Big Three.[10] Moreover, a limitation on entrance of new firms resulted from the Government's policy of creating huge integrated operations. Except in time of war, or preparation for war, the normal growth in demand for aluminum is gradual and can be met easily by the addition

[8] Reynolds obtained the 750,000 ton per year Hurricane Creek, Arkansas, alumina plant; the Jones Mills, Arkansas, and Troutdale, Oregon, reduction mills (145,000–150,000 tons annual capacity); and the McCook, Illinois, rolling mill (144,000 tons per year capacity.)

[9] Edward H. Chamberlin, *The Theory of Monopolistic Competition*, Sixth Edition (Cambridge, 1948), pp. 46–51.

[10] For an interesting account of the failure of the Government's plan for competition, see the testimony of Arnold Troy in *Study of Monopoly Power*, Hearings before the Subcommittee on Study of Monopoly Power, of the Committee of the Judiciary, House of Representatives, 82nd Congress, 1st session, Serial No. 1, Part 1, Aluminum, pp. 314–352.

of new potlines to existing reduction capacity—provided excess alumina capacity exists.[11] This contrasts with the difficulty of entering the market with a completely integrated operation of economical scale. Thus the opportunity for the Big Three to expand by relatively small increments as postwar demand increased made it virtually impossible for new firms to enter the industry. For the latter, no opportunity existed in the absence of a sharply increased demand sufficient to accommodate expansion by established producers as well as the entire output of new, completely integrated operations of economical scale.

A second impediment to competition was the artificial reduction in fixed costs for the Big Three resulting from their purchase of Government facilities. Possessing facilities of yet undetermined peacetime value, and faced with a competitor of Alcoa's magnitude, the Government made the plants available ultimately at a figure approximately 37 per cent of original cost. Kaiser, for example, obtained ore refining, reduction, and fabricating facilities for $36 million—or roughly only 20 per cent of current replacement cost.[12]

By contrast, during 1951 through 1953 the Government sought to encourage new producers to enter the aluminum field by granting comparatively limited inducements. Accelerated amortization and markets guaranteed for a five-year period were provided. The guaranteed market, however, afforded a price equivalent to the average of the prices established by the Big Three.[13] Under such conditions the Big Three alone were in a favorable position to participate in the program by virtue of (1) their practice of administered pricing, coupled with, (2) their artificially low cost at existing facilities, and (3) their comparative ease in obtaining financing. Having a substantial block of low-cost capacity, established producers were able to obtain low interest money for expansion and to take full advantage of accelerated amortization on new facilities while maintaining stable prices on virgin aluminum. Prospective new producers, however, discovered accelerated amortization and guaranteed markets to be of dubious value because of (1) inflated original costs, (2) inadequate collateral to provide low-cost financing for a large integrated operation,[14] and (3) the administered prices on pig and ingot. Testimony presented by one such prospect suggests that the stipulated stockpile price would have provided a return of some $40 per ton *less* than estimated production costs.[15] As a result, the Big Three have obtained

[11] For example, additions of a seventh and eighth potline to Kaiser's Spokane reduction mill was achieved at a nominal investment by use of equipment from dismantled uneconomic wartime built Government reduction mills. In Alcoa's case, an expansion of a relatively small amount was accomplished by the substitution of the larger Point Comfort, Texas, plant for the small obsolete Niagara Falls plant.

[12] Equity 85-73 Defendant's Exhibit No. 158, p. 24498, In the Case of United States v. Aluminum Company of America, et al. District Court of the United States, Southern District, New York.

[13] *Study of Monopoly Power*, Part 1, Aluminum, pp. 600–1.

[14] For these operators, Government guaranteed loans increased money costs to 5 per cent per annum in contrast to the 3 to 3½ per cent interest loans available to established producers.

[15] *Study of Monopoly Power*, Part 1, Aluminum, p. 506.

the preponderant share of the defense certified new capacity. Jointly Alcoa, Reynolds, and Kaiser obtained over 800,000 tons of the total 875,000 tons certified by DPA under the first two rounds of expansion. Anaconda Copper Mining Company obtained the remaining 8 per cent, representing the sole new entrant under the expansion program. A third round, authorizing 214,000 tons allocated to Harvey Machine Company, Olin Industries, and the Wheland Company, has recently been canceled after these firms encountered financing difficulties, the same problem that attended Harvey's and Apex Smelting Company's attempts to enter the first round of expansion more than three years earlier. Under the circumstances the recent Government attempt to promote competition in the industry promises little more success than was achieved by its disposal program.

A legitimate concern for the need to preserve economies of scale doubtless influenced both the action of the Court and the Surplus Property Board in their stewardship of the public trust. It is appropriate to suggest, however, that neither adequately perceived the nature of these economies—in particular, the stage in the process where the economies appear. Failing to recognize that scale economies occurred almost exclusively in the initial production stage, i.e., in the refining of alumina, the Government did not perceive the opportunity provided for positive antitrust policy. It thereby eliminated a set of possibilities for creating an industry of many firms without destructive consequences for productive efficiency.

## IV. VARIATION IN SCALE ECONOMIES AMONG PRODUCTION STAGES

Typical of many chemical processes, the extraction of alumina is attended by substantial economies of scale.[16] But huge reduction and fabricating facilities are required (from the standpoint of efficiency within an integrated firm) only to enable a scale of total operations which will realize economies of scale at the alumina stage. If there were a competitive market in alumina from which small independent firms could obtain refined ore in small quantities at costs equivalent to those obtained by any operator irrespective of size, there would be little justification for the massive superstructure of related facilities integrated through successive stages.

At the fabricating stage, the variety of end products required to serve the ultimate market permits economical operation of rolling mills over a wide range of capacities. Aluminum Products of La Grange, Illinois, for example, operates rolling facilities of only 2,000 tons annual capacity, while Alcoa's largest rolling mill (located in Tennessee) has an annual rated capacity of 300,000 tons. Within this range exists an opportunity for a variety of different sized rolling mills depending on the ultimate product markets to be served. Similar conclusions apply to other fabricating operations such as extruding, forging, casting, etc. The existence of some 17,000 independent aluminum fabricators utilizing largely secondary metal attests to the feasibility of small-scale full- and semi-fabrication.[17]

[16] Engle, Gregory, and Mossé, *Aluminum, An Industrial Marketing Appraisal* (Chicago, 1945), pp. 219–222.

[17] *Study of Monopoly Power*, Part 1, Aluminum, pp. 315, 326.

There is general agreement that economies of scale are of negligible importance in the reduction stage as well, where the refined ore is reduced to metallic form.[18] Aluminum is reduced in a series of identical electrolytic cells of quite limited size. For all practical purposes, these correspond to the economic case of perfect divisibility. In practice, a small number of joint facilities are required which provide a limited opportunity for economizing investment with increasing scale; yet even these facilities represent but a minor part of total investment. Total capital outlays, hence, tend to rise almost proportionally with capacity.[19]

At the ore refining stage, however, economies of scale are substantial. According to a study made by Engle, Gregory, and Mossé, the difference in the cost of production between a 100,000 and a 500,000 ton per year alumina plant amounted to approximately 20 per cent at early 1940 price levels.[20] An additional difference, not observed by the authors, ordinarily appears in raw material handling costs. Where the size of a plant will not justify investment in bulk unloading facilities, discharging bauxite from ore carriers will approximate a dollar to a dollar and a half more per ton if gondolas must be relied on. This represents an additional $4 to $6 difference in the final cost per ton of aluminum.[21]

Further evidence regarding scale economies is indirectly suggested in the engineering studies undertaken at the request of the Surplus Property Board preparatory to its disposal of Government facilities. The Dorr Company, which conducted a study of the Baton Rouge alumina plant, estimated the cost of producing alumina at three alternative levels, 300, 500, and 1000 tons per day.[22] Although this is not the same as estimating costs for separate facilities specifically designed to operate at these levels, the estimated charges on plant and equipment

[18] Donald H. Wallace, *Market Control in the Aluminum Industry*, pp. 190-1. Also, Engle, et al, *op. cit.*, p. 221.

[19] Cecil H. Chilton, "Sixth Tenth Factor Applies to Complete Plant Costs," *Chemical Engineering*, Vol. 57, No. 4 (April 1950) pp. 112–114. The rule that "costs at a second [plant] $X$ times the first may be obtained by multiplying the known cost by $X^{0.6}$" is developed from data on a variety of chemical process industries. For aluminum reduction, however, doubling the size of a given plant requires approximately a 90 per cent increase in capital outlays (p. 112).

[20] Engle, et al, *op. cit.*, pp. 219–223.

[21] Professor Wallace in his monumental work (*op. cit.*, p. 193 N 193 and 194) suggests that after an alumina plant "has become large enough to utilize fully the best size and type of boilers, kilns and pumping system, further enlargement results only in duplication . . . enlargement beyond a scale designed for an output of 50 tons of alumina a day (15,000–18,000 tons per year) brings no savings in cost of capital equipment per unit of output, and offers very little opportunity for economizing labor." Professor Wallace came to these conclusions on the basis of information obtained from *Aluminum Industry* (published 1930), a description of the Salindres plant in *Engineering* CVI (August 1918), a personal visit to a plant and an authoritative opinion.

Judging from the experience in the domestic aluminum industry in recent years (1940–present) where newly built plants have exceeded 400,000 tons annual capacity and from recently published works by consulting engineers (Aries and Newton, *Chemical Engineering Cost Estimation*, New York, 1951, pp. 62–63, and Chilton, *op. cit.*) additional economies of scale appear to be realized far beyond the level estimated by Wallace.

[22] *Baton Rouge Alumina Plant*. E. O. 1432, Report of the Dorr Company to the Surplus Property Board, unpublished Government document.

excluded all facilities not required at the lower production levels.[23] Fifteen of twenty-three items of cost revealed differentials among the three operating levels. Average unit cost for the 500 and 300 tons per day production level were, respectively, 14 and 27 per cent above unit cost for the 1000 ton per day operating level.[24] Again these estimates make no allowances for differential unloading charges between large plants using bulk unloading facilities, and small ones for which such facilities would not be justified or at least substantially underutilized.

The evidence available does not permit determining the precise level at which scale economies are fully realized in the production of alumina. It does establish, however, that a substantially smaller number of alumina plants than aluminum reduction mills are required to serve a given market economically. Accordingly, it appears that the "Dilemma of Antitrust Aims" in the aluminum field could be resolved if a large number of competing nonintegrated aluminum producers could draw on a smaller number of competing large-scale alumina plants for their ore requirements. The question then becomes: What arrangements could be conceived whereby efficiently scaled alumina plants could produce refined ore for sale in a competitive market to a larger number of independent reduction mills, thereby preserving efficiency in production and realizing the benefits of competition?

## V. ALTERNATIVE POLICY FOR COMPETITION IN THE ALUMINUM INDUSTRY

What alternatives might the Government have adopted to encourage growth of an efficient competitive aluminum industry? Considering that the Government petition for relief in its antitrust suit was developed along with its disposal program, a horizontal rather than a vertical divestiture would have seemed more appropriate.[25] Had the Government pressed for divestiture along these lines, concurrently offering assistance in organizing a competitive market in alumina through its disposal program, a much more convincing rationale for divestiture would have existed for the Court to consider.[26] Four separate alumina plants would have been available initially, with sufficient capacity to supply the eleven existing economic reduction mills, and ten to twenty additional small smelters.

At the reduction stage sixteen plants were in existence following the war. Alcoa owned five with an annual economic capacity of approximately 332,750

[23] *Ibid.*, pp. 62–66.

[24] *Ibid.*, p. 69.

[25] The term "vertical divestiture" is used in this context to correspond to Judge Knox's use of the term. That is, severance of Alcoa vertically to produce two vertically integrated firms. Horizontal divestiture will be used here to mean the separation of the ore refining facilities from the reduction and further stages of production.

[26] The economic feasibility of the Justice Department's actual proposal was subject to considerable question. One of the two integrated firms to be created from the facilities owned by Alcoa would have received the obsolete and high cost East St. Louis plant at which variable costs alone exceeded by approximately 35 per cent total costs at more recently built plants. It is certainly open to legitimate skepticism whether a weakened Alcoa, or the second firm to have been created from the remnants of Alcoa's facilities, would have had the vitality to reorganize the disparate parts into an efficient system.

tons.[27] Reynolds owned two small plants with a combined annual economic capacity of approximately 80,000 tons.[28] The remaining four economic mills representing 272,000 tons[29] were available to establish four additional independent operators, while the 368,000 tons of new Government-built capacity, which was uneconomically located in high cost power areas, was available for dismantling and relocation to more economic sources of power. This could have provided the basis for assistance to additional new firms. Conceivably a dozen new firms could have been induced to enter the field, given the facilities with which the Government had to work and provided a competitive supply of alumina were available. Could such a competitive supply have been established?

The practical task for professional economists was to propose some scheme for successful organization of a dependable competitive supply of alumina. The scheme should have been conceived to serve both the ends of efficiency and competition. Two such schemes are advanced below. It is not suggested that these exhaust the possibilities. They are presented primarily to outline an approach to the antitrust problem and to stimulate further discussion.[30]

*Government Operation of Alumina Plants.* In order to separate ore refining from successive stages, a public corporation could have been established and authorized to produce alumina for sale on a competitive basis to any aluminum producer. Such a corporation would have been able to meet the pooled requirements of the industry from the operation of the two wartime built Government alumina plants. This would have enabled a relatively large number of small metal producers to obtain alumina from a dependable source in small quantities at costs competitive with Alcoa's. This plan could have been implemented without any disruption of Alcoa's operation, and yet removed one of the important economic barriers to growth of competition.

However, unless the reduction capacity brought into operation through the disposal program would have equaled the total Government capacity (economic and otherwise) a significant amount of excess alumina capacity would have existed initially both within the Government's, as well as Alcoa's, block of capacity. A pooling of production facilities at the ore refining stage, accomplished through divestiture of Alcoa's alumina plants, represented an alternative with the public corporation achieving a monopoly in the production and marketing of alumina.

The plan to permit a Government monopoly in the refining stage could have

[27] 91 Federal Supplement No. 3, pp. 365–6. Economic capacity as derived by Judge Knox represented that portion of total rated capacity for which there existed an economic supply of power.

[28] *Ibid.*, p. 367.

[29] See "Aluminum Plants and Facilities," *Report of the Surplus Property Board to the Congress*, September 21, 1945, Appendix 15c, pp. 116–118.

[30] A general scheme requiring considerable modification for application to specific industries has been advanced by Alfred Oxenfeldt, "Monopoly Dissolution: A Proposal Outlined," *American Economic Review*, June 1946, pp. 384–391. A plan involving some features in common with Oxenfeldt's was advanced by an independent fabricator at the Celler Committee Hearings (*Study of Monopoly Power*, Aluminum, p. 352). Both plans have merit but also contain a number of shortcomings which the proposals outlined below avoid.

led to efficient utilization of capacity under ideal management. It may be objected, however, that there would have been no "economic" incentive to achieve lowest costs within plants and further might have been quite disruptive of productive efficiency during the plan's implementation. But of equivalent importance is the prevalent political objection to any extension of governmental operations into fields which private enterprise can manage. In view of the critical significance of aluminum in our economy, particularly for defense purposes, and the legitimate concern over the monopolistic character of the industry, a justification for governmental intervention might have been made, provided no alternative existed. It appears, however, an alternative scheme could have been advanced.

*Multiple Producer Cooperatives in Alumina.* As an alternative to a Government monopoly in alumina production and marketing, or a public corporation established to provide an alternative source from which non-integrated producers could buy independently of Alcoa, a special adaptation of the cooperative arrangement could have been considered. Admittedly, the plan would have lacked the simplicity and would have been more difficult to implement than either the actual disposal program or a governmental operation. But the results obtained would have approached more closely the objectives of governmental antitrust and disposal program policies, with a minimum of governmental intervention. Essential features of such a proposal would have been:

1. Separation of ore refining from higher stages.
2. Organization of producer cooperatives at the ore refining stage each consisting of one alumina plant (with a possible exception) and several reduction operator-owners.
3. Government retention of all shares representing excess capacity for sale at request of any future new producer.
4. Distribution of shares in cooperative among members commensurate with each member's reduction requirements.
5. Restriction of shares to only one alumina cooperative for each member.
6. Provision of only one vote for each member irrespective of number of shares held.
7. Value of shares to reflect capitalized prospective earnings of each plant.
8. Adoption of a uniform system of accounts open to inspection.
9. Sharing of profits by members in proportion to shares held.
10. No restriction on members with respect to alumina cooperative from which ore is purchased.
11. Restriction of purchases to spot transactions, with identical prices f.o.b. refining plant, to all purchasers.
12. Qualification of new producers for purchase of alumina to consist of prior purchase of shares in a cooperative commensurate with producer's ore requirements.

*Minimum Disturbance to Existing Operations.* Divestiture of Alcoa's ore refining facilities along with retention by the Government of its wartime built alumina plants would have provided for the separation of stages and provided the facilities about which producer cooperatives could have been organized. In

the interest of maintaining uninterrupted levels of production, one producer cooperative could have been established consisting of Alcoa and three to five additional small producers,[31] based on the refining capacity previously held by Alcoa.[32] Two additional cooperatives could have been formed using the Government's Hurricane Creek and Baton Rouge refining facilities in a manner to achieve a relatively equal distribution of reduction operators between them.[33]

*Ease of Entry.* With the Government holding shares representing excess capacity in alumina and required to make these available on request of any prospective producer, any small firm could have obtained alumina for a small reduction operation as economically from the market as it could have through integrating on a grand scale. This would have enabled a number of relatively small concerns to enter the field with $5–$12 million in lieu of the $150–$225 million required for an economically scaled set of completely integrated facilities. Small firms manifesting interest in the recent expansion program[34] thus could have competed in a meaningful way for the three-quarters of a million tons of certified capacity which went by default to the Big Three during the recent Government expansion program.

*Incentives to Compete.* On the reduction level, the larger number of reduction

[31] To have been created from the Government's surplus reduction capacity and Government-held shares in excess refining capacity.

[32] This capacity was represented by the 600,000 (plus) tons annual capacity of the Mobile, Alabama, and roughly 400,000 tons annual capacity of the East St. Louis plants. A cooperative involving the two formerly owned Alcoa alumina plants might have represented the only exception to the rule that one cooperative would be organized about each refining plant.

Alternatively, a plan could have been developed around a single large alumina producer cooperative involving all of the ore refining plants, with the provision that members share in the profits in relation to purchases. The latter stipulation would promote sales competition, conceivably, but the scheme would not incorporate sufficient incentives to strive for intra-plant economies, and also would represent an invitation to restrict output to affect prices at the final stage.

[33] The provision that value of shares in cooperatives reflect capitalized prospective earnings of individual plants would have led to indifference on the part of reduction mill operators as regards the cooperative to which they would be assigned. This would have permitted freedom in the organization of cooperative memberships.

Theoretically, since transportation costs could not be incorporated easily into the determination of individual plant's going concern value for individual reduction operators, reluctance on the part of some reduction operators might have developed regarding assignment to a particular cooperative. Practically speaking, however, this was not likely to have happened. Refining facilities were clustered either at the source of domestic bauxite or on the Gulf Coast ports of entry for imported bauxite. Reduction mills, on the other hand, were clustered in areas where electrical energy was available at low rates. The difference in freight rates on alumina from alternative refining plants to any particular reduction mill would have been negligible (because of the negotiated nature of freight rates governing alumina movements) or could have been equalized by negotiations with carriers where differences appeared probably. *Cf.* Ex Parte 175a and 175b; T.C. 1-A, B, and C; C.F.A., 218-N; and N.O.F.T.B. 3-B.

[34] Apex Smelting Company, Eastern Metal Products Company, Independent Aluminum Company, National Aluminum, Spartan Aircraft, Harvey Machine Company, Olin Industries and The Wheland Company.

operators would have been a long stride toward sufficient numbers to provide unqualified competition. At the alumina stage, Government ownership of shares in each of the three cooperatives (to the extent of initial excess capacity) would have been an effective barrier, originally, to collusion among members of separate cooperatives. However, governmental participation in the ownership would not have been necessary to preclude collusion as other provisions would have promoted self policing.

The provision that no aluminum producer could have held shares in more than one cooperative would have erected an obstacle to restrictive agreements (governing both refining and reduction) through contacts established at the refining stage. With this obstacle to collusion among producers of different cooperatives no incentive would remain for restrictive agreements among members within any cooperative. Competition among aluminum producers of different sets would result in losses to participants of "within set" agreements. And a precaution against any one producer's dominating the policy of his cooperative would have been provided by the limitation on voting to a single vote irrespective of number of shares held.[35]

*Incentives to Efficiency.* With excess capacity initially in refining and marked differences in costs among plants[36] efficient resource allocation demanded that only the plants with the lower variable costs be operated. Furthermore, since variable costs at these plants were higher for low levels of operation than at levels nearer those for which the plants were designed,[37] operation of all plants at a fraction of capacity actually resulted in avoidable excess costs.[38]

Competition among reduction operators would have ensured that no alumina plant would have remained in operation so long as its average variable cost exceeded the market price.[39] Idling of the extra-marginal plant, therefore, would

[35] Since Alcoa would have provided the bulk of financial resources for the cooperative of which it would have been a member, but would have been entitled to no greater voice in management than any of the remaining three to five cooperating members, consideration might have been given to providing Alcoa with an option. It could have been authorized to elect dissolution into as many independent firms as it possessed reduction mills. If the stockholders elected to do so, presumably it would be in their interest, and certainly in the interest of a competitive industry.

[36] "Alumina Plants and Facilities," *op. cit.*, Appendix 15b, 112–115; also 91 Federal Supplement No. 3, p. 368.

[37] Dorr Company Report to the Surplus Property Board, *op. cit.*, p. 69.

[38] See notes 40 and 41 following.

[39] The larger number of independent reduction operators along with other features of the proposal (3, 5, 8 and 10–12) would have provided the environment for competition on the reduction level. If this would have been achieved, managers of intra-marginal alumina plants would have been faced with a horizontal demand curve and would have operated at capacity or where marginal costs equaled price. The marginal plant, providing the incremental supply, would have been faced with a sloping demand curve and on it would have devolved the task of appraising the market for alumina and adjusting quantity in accordance with its appraisal of market demand. For this cooperative, the intersection of marginal cost and marginal revenue would have dictated the quantity to be produced and, indirectly, the offer price. The marginal firm, however, would have had the role of only qualified price

have reallocated the market requirement among the remaining low variable cost plants. This would have led to greater economy at those plants as production volume expanded to points lower along the declining portion of the average cost curve at plants left in operation.[40] Moreover, competition from reduction operators of different cooperatives would exert pressure on the managements of alumina plants to achieve maximum intraplant economies.[41]

This plan would overcome the objectional economic features of the Government-operated alumina plants since economic incentives would exist both for purchases from the most economical source irrespective of ownership, and for insistence that management of cooperatives achieve maximum operating efficiency within individual alumina plants. Furthermore, ownership and control of refining facilities by the ultimate users of alumina would have ensured that the major economies available through vertical integration would be preserved.[42] This plan also is more consistent with the prevalent feeling that private arrangements should be sought to achieve socially desirable ends in preference to the extension of Government participation in the economic sphere.

*Equalization of Initial Advantage.* The value of shares in alumina cooperatives could have been adjusted to provide for capitalizing anticipated earnings; otherwise variation in costs among plants would have operated to the disadvantage of those reduction operators assigned to the higher cost alumina plants. After operating experience regarding production costs had been obtained, renegotiation of the initial terms at which shares were made available could have been considered because of the difficulties inherent in estimating earnings in advance of operation. In this manner, otherwise unjustified economic rents could have been applied to recovering the Government's investment in the facilities it had provided. This would have provided relatively equal opportunity for all new producers, and made it a matter of indifference (economically) to aluminum producers as regards which alumina cooperatives they would join.[43]

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leadership for, whenever the price determined by the intersection of marginal cost and revenue at the marginal plant exceeded the average variable cost at the extra-marginal plant, the marginal cooperative would face a restraint on its ability to control the incremental supply.

[40] Since 1) delivered cost of alumina to Alcoa's reduction mills was less than production costs (even omitting capital charges) alone at its East St. Louis plant, and 2) the Government's alumina plants together with Alcoa's Mobile plant represented between 1.9 and 2.1 million tons of alumina capacity, whereas the total ore requirements of all economic reduction mills was in the neighborhood of only 1.4 million tons annually, the East St. Louis plant would have been the extra-marginal plant. Records indicate that the Hurricane Creek and Mobile plants would have been the lowest variable cost plants whereas the Baton Rouge plant would have been marginal.

[41] Profits from the operation of alumina cooperatives would have been shared by reduction operators in proportion to shares held. Being in competition with reduction operators with shares in other cooperatives, members of each cooperative would have incentive to reduce costs at their own cooperative.

[42] Cf. Wallace, *op. cit.*, pp. 182 and 188.

[43] For more extended discussion of this point see note 33 above.

## VI. SUMMARY AND CONCLUSIONS

In lieu of providing for a relatively large number of aluminum producers, the Government's antitrust programs actually set up only one new producer and contributed to the enlargement of another. To enable them to compete on relatively equal terms with Alcoa, they received facilities under conditions which provided an artificial and extremely favorable cost structure. In the process they obtained control over alumina capacity far beyond their immediate requirements which they operated at uneconomical levels.[44] Existing producers, controlling the supply of alumina, and in possession of excess capacity, were able to absorb the gradually increasing demand for aluminum by the simple addition of potlines to existing reduction mills. New producers, having no access to the surplus alumina capacity[45] had little opportunity to enter the market. But equally important, when the demand expanded sharply as it did during the 1950–54 mobilization effort, independents with $2 to $6 million in venture capital could not compete in the money market for the $150–$225 million required for a completely integrated operation, when faced with such formidable competition. Consequently, the recent Government financial incentives to the industry for expanding capacity have gone almost exclusively to the Big Three at the expense of potential competitors.

This might have been avoided had consideration been given to some alternatives for resolving the monopoly problem. The Antitrust Division, however, missed its opportunity to obtain appropriate relief through its failure to appreciate the full range of possibilities in the aluminum case. Despite the fact that jurisdiction in the case will be retained by the Court until 1955, it is unlikely that appropriate modification of the market structure can be effected even should the Justice Department press for further relief. The prosecution has been framed in terms of a single firm, whereas the foregoing analysis suggests an industry-wide approach alone could promise a reconstruction of the industry along lines consistent with competitive standards.

The lost opportunity in aluminum may have served a purpose, however, if it has provided insight as to the critical points for future Government policy as

[44] The economic Baton Rouge plant, after disposal to Kaiser, was operated at an uneconomic one-third of capacity, while the economic Hurricane Creek plant was operated by Reynolds similarly at approximately one-half to two-thirds of capacity. Alcoa, on the other hand, with ore requirements in excess of capacity at its economic Mobile plant, operated the obsolete East St. Louis plant at costs approximately 35 per cent above costs at alternative under-utilized economic facilities.

[45] Despite the fact it was intended that supplies of alumina from surplus Government-built capacity be made available to new entrants by Reynolds and Kaiser, adequate provision to ensure execution of these agreements was not made. Consequently, Reynolds declined to sell alumina to a prospective producer despite excess capacity at his plant, while Kaiser offered to supply alumina only at exorbitant prices (approximately a 100 per cent markup). Alcoa alone offered to supply the producer at a figure which was reasonable from Alcoa's standpoint (to cover the cost at the East St. Louis plant) but prohibitive from the standpoint of the producer in question. See *Study of Monopoly Power*, part 1, Aluminum, pp. 342–4.

further expansion in the industry continues. This is particularly true when the Government, through incentive devices, plays a dominant role in promoting expansion in the industry. A properly conceived and implemented long-range program can begin to restructure the industry no less surely, if more gradually and with less disruption of production, than legal divestiture.

Furthermore, aluminum as an illustrative case can focus attention on other industries where parallels exist. Although details will differ in individual cases, the approach outlined herein should be considered wherever a positive relation between efficiency and size is confined to a single stage in a vertically integrated enterprise. Conceiving and implementing workable arrangements, whereby economic concentrations are confined to those areas technically required for the realization of efficiency, is advanced as a promising approach to resolve "the dilemma of antitrust aims."

# PROLEGOMENA TO THE TESTING OF UTILITY THEORY

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The arguments of this paper are based on the assumption that, if economics is to advance as a science, economists must increasingly resort to empirical testing of the theories of economics. The reader who rejects this premise will be out of sympathy with the thoughts that follow, because the substance of these thoughts is a series of proposals concerning direct experimental testing of the theory of consumer's preferences.

The theory to be subjected to the proposed testing is the "ordinal" theory of utility. This theory assumes that the consumer is capable of ranking various collections or "budgets" of goods according to their desirability to him. There is no assumption that the consumer is able to convey, either consciously or unconsciously, to an observer the number of units of utility that he receives from any budget of goods, i.e., there is no implication that utility is measurable in the neo-classical sense. A further assumption is made to the effect that the consumer will choose the most desirable or the highest ranking collection of goods that his income will allow him to choose.[1]

Before testing is undertaken, it is desirable that the would-be experimeters think out, insofar as it can be done, the problems they are likely to encounter. It is toward this goal of pre-experimental planning that this paper is oriented. First, it may be observed that in some cases the decision as to the desirability of various goods will be a group decision. In the case of unattached individuals this, of course, is not true, but in the case of families the decisions may be group decisions and special problems may arise from this fact. Another problem that should be considered is the possibility that individuals behave differently toward different types or classes of goods. This raises certain interesting questions as to the structure of the preference function itself. The problems that might arise from the family group decision process and from the different regard that individuals have for different types of goods will be considered below. In addition, certain means of testing that have been suggested by various authors will be reviewed. Finally, a different type of attack on the problem of testing the theory will be suggested.

## I

In cases in which decisions as to the desirability of different goods are group or family decisions, several interesting possibilities arise. For example, do many families have a "ruler" who makes most or all of the important decisions? On

[1] For a thorough discussion of this theory of consumers' preferences see P. A. Samuelson, *Foundations of Economic Analysis* (Cambridge, Mass.: Harvard University Press, 1947), pp. 90-202.

the basis of the ordinary experiences of life, it will probably be agreed that there is an appreciable number of families whose purchasing decisions are made in this fashion. In such a case there is no group decision and the entire group or family simply accepts the preference pattern of the ruler; we are back to the one-person case.

On the other hand, there are families whose decisions are joint decisions, the results of consultation and careful consideration of the welfare of all members of the family. In this case we certainly cannot speak of the preference function of an individual; instead the family preference function is an amalgam of the preference functions of two or more individuals. This means that the family preference function may not obey some of the consistency criteria laid down by the theory of individual consumer's preferences, e.g., it might not obey the transitivity axiom. This may be true because the family preference function is made up of individual, and possibly conflicting, preference functions.

We are all acquainted with families who appear to have no preference function, who drift from one impulsive purchase to another. Can it be said that these families are following any sort of consistent preference pattern, or might their behavior be better treated as being in some sense random?

Questions about the composition of the decision unit and the method of making decisions are essentially empirical; they cannot be answered in a satisfying way by conjecture. The foregoing speculations are intended to be merely suggestive.

Nonetheless, it seems shortsighted to talk about empirical tests of preference patterns until we know something about the composition of the preference or decision unit and the manner of arriving at decisions. It seems clear that this is a problem in psychological experimentation and, consequently, tends to fall outside the economist's area of competence. Nevertheless, a direct attack on the problem might prove illuminating. Interviewing families and asking either directly or indirectly about methods of making purchase decisions might very well reveal the different patterns of decision making.

## II

Another preliminary matter that should be considered relates to different types of purchase decisions. For example, some purchase decisions, such as the number of cigarettes bought per week, are routine in nature; others call for more careful weighing of alternatives, for example, the purchase of clothing. A third type of decision includes matters of major expenditure such as buying a house. These are surely obvious classifications; no doubt sub-classifications exist within these classifications and perhaps still other general classifications exist.

The reason for mentioning these classifications is not purely taxonomic. There is a possibility that, within a given decision unit, say a family, different preference functions govern different classes of purchase decisions. One pattern may apply to major expenditures while another governs less expensive durable goods. When making purchase decisions, people cannot possibly consider simultaneously all alternative ways of laying out their incomes; they must narrow the field of

choice in some arbitrary way. A seemingly natural way of delimiting the field of choice is to compare possible purchases that fulfill somewhat similar needs and make a somewhat similar impact on the budget. For example, it seems much more likely that the members of a purchasing unit will compare a refrigerator, a washing machine and a television set than they would compare a tube of toothpaste, a suit of clothes and an automobile. If consumers do limit the field of choice in this way, then it is quite possible that somewhat different criteria apply to the different classifications of purchase decisions.

If it is true that different criteria govern the decisions within the various purchase classifications, then we have in effect different preference functions for the different classes of purchase decisions. This means that, on the basis of experience and observation, there is some reason for believing that a consumption unit has not one but several different preference functions. Consequently, there is a possibility that these different functions are not consistent in the sense of being parts of an overall preference function. This would appear to be an area worthy of investigation.

These two preliminary matters, the composition of the purchasing unit and the classification of purchase decisions, have been discussed for two reasons. First, they are matters of some interest in themselves, and if we had reliable information about them, our understanding of consumers' behavior would be enhanced. Secondly, if these preliminary matters have merit, they should be considered in any empirical studies or experiments with consumers. That is, we should be sure that we are actually dealing with a purchasing unit—not just one member of a purchasing unit, and we should be sure that we are dealing with only one class of purchasing decision. If these precautions are not taken, we might find ourselves getting results from an incomplete unit governed by conflicting criteria.

## III

We shall now turn to a consideration of some actual tests of the theory of consumer's preferences. To carry through testing we must find some aspect of the theory that is a necessary part of the theory and that can be stated solely in terms of objective, observable qualities or quantities, so that they can serve as the testable characteristics of the theory. One such aspect of the theory, the transitivity condition, has already been studied in pioneering efforts by May,[2] and Hurwicz and Papandreou.[3]

The transitivity condition may be illustrated by letting $X_i$ indicate the $i$-th bundle of goods the consumer considers and by using the symbol $R$ to indicate the relation "preferred or indifferent to." The theory says the consumer can make an ordering of bundles of goods, e.g.,

$$X_1 R X_2 R \cdots R X_n.$$

[2] K. O. May, "Transitivity, Utility and Aggregation in Preference Patterns," *Econometrica*, XXII, pp. 1-13.

[3] A. G. Papandreou, "An Experimental Test of an Axiom in the Theory of Choice" (abstract), *Econometrica*, XXI, 1953, p. 477.

Then the transitivity condition says that if

$$X_i R X_j,$$

and

$$X_j R X_k,$$

then it must follow that

$$X_i R X_k.$$

It can be shown, if indeed it is not obvious, that the transitivity condition is a necessary part of the theory of consumer's preferences. This means that if we can show empirically that the transitivity rule is not obeyed by individual consumers then there is something wrong with the existing theory of consumer's preferences. Consequently, it seems clear that this type of test is one of potentially great importance.

Now May's results, although they deal with non-economic choices, show a rather surprising tendency toward non-transitivity in human choices.[4] If this tendency carries over into consumer's choices, then economists must seek further explanations of these matters.

May suggests, as a partial explanation of non-transitivity, that the rankings may be made according to conflicting criteria.[5] That is, if the individual is guided by one criterion in one choice-situation and by a different criterion that conflicts with the first criterion in a different choice-situation, then a series of choices made by him may be non-transitive. This is true because the ordering of preferences is made by several different criteria and hence may not be consistent in the sense of following the transitivity rule.

It now seems clear that non-transitive preference patterns may arise in cases where the effective preference pattern is a family preference pattern, an amalgam of conflicting individual preference patterns. Essentially the same point is made by May with respect to the aggregation of preference patterns generally without special reference to families. A little reflection shows a close connection between this point and the well-known difficulties in welfare economics pointed out by Arrow.[6]

If it is true, as was suggested earlier, that different preference functions or patterns exist for different types of goods within a single consumption unit, then an array of choices involving different types of goods may be non-transitive. This would follow because, again, conflicting criteria would be used in ranking the various bundles of goods. Consequently, in experiments testing the transitivity condition, we should be careful to distinguish different types of goods that must be compared differently by the consumer, to avoid putting the subject of the experiment in the position of having to choose according to conflicting rules.

[4] May, *op. cit.*, pp. 3–8.
[5] *Loc. cit.*
[6] K. J. Arrow, *Social Choice and Individual Values* (New York: John Wiley & Sons, 1951).

Thus far we have assumed only that the consumer can rank various alternative bundles of goods according to their desirability; that he will choose the highest ranked bundle that he can afford, and, from this, we saw that the transitivity condition should hold according to theory. Suppose we now add the condition that more goods are considered better, or at least not worse, than fewer goods. In other words, generally consumers prefer more goods to fewer goods.[7] This condition is rather misleadingly referred to as the "non-satiety" condition. Actually there is no conflict between this statement and the existence of a satiety level for consumption goods for individual consumers.

Some writers have maintained, presumably of either budgets or indifferent classes, that transitivity is both a necessary and a sufficient condition for the existence of a preference function or pattern. This means that not only is the transitivity condition implied by the existence of a preference function, but that the transitivity condition implies the existence of a preference function. May adopts an explicit procedure and shows that under certain assumptions transitivity is both necessary and sufficient for finite sets of indifference classes. May, however, does not make the "non-satiety" assumption that we have invoked. No doubt May is correct, but if the "non-satiety" assumption is used, then transitivity is not sufficient for the existence of a preference function. This may be seen easily by noticing that the transitivity condition is just as compatible with the opposite assumption that fewer goods are better than more goods as it is with the non-satiety assumption.[8] Basically this is true because transitivity depends only on the rankings of the budget, not on the composition of the budgets. Hence, transitivity demands only consistent rankings of the budgets irrespective of their compositions.

## IV

There is another aspect of the theory of consumer's preferences that is expressed only in objective quantities that may prove to be a means of testing the theory. This condition states that in equilibrium the marginal rate of substitution between two goods must equal the ratio of their prices. This is the familiar condition that the budget line must be tangent to the indifference curve for the consumer to have reached an optimum.

This condition may be stated in symbols as:

$$\frac{p_i}{p_j} = \frac{\delta x_j}{\delta x_i}.$$

Here the $p$'s indicate prices of two goods, the $x$'s stand for quantity of the two goods and the $\delta$'s symbolize small changes in the quantities.

[7] If $\varphi(x_1, \cdots, x_n)$ is the preference function and the $x$'s represent the various goods, then the non-satiety assumption says that

$$\varphi_i \geq 0, \qquad (i = 1, \cdots, n);$$

where the subscript indicates partial differentiation with respect to $x_i$. Cf. H. Wold, *Demand Analysis* (New York: John Wiley & Sons, 1953), p. 82, pp. 93–4.

[8] In the notation of footnote 7 transitivity is compatible with the assumption $\varphi_i < 0$; or it is compatible with a monotonically decreasing preference function as well as with a monotonically increasing function.

It may easily be seen that the preceding equation involves only observable values, i.e., prices and quantity changes. Thus, it may be possible to contrive an experimental situation into which small price changes are introduced and the resulting quantity changes are observed. Then the two ratios could be calculated and compared. It seems likely that a great deal of care would have to be exercised in setting up the experimental conditions. It is, of course, necessary that income remain constant during such an experiment.

Alternatively, it might be possible to obtain family budgets before and after a move from one vicinity to another with slightly different prices prevailing in the two locales. Thus, quantity changes could be observed and compared.

Two theoretical difficulties stand in the way of the empirical procedures suggested above. The first difficulty derives from the fact that the equality of price ratio and marginal rate of substitution holds only at a point. I.e., the budget line is *tangent* to the indifference curve. This means that the quantity changes must be small in the mathematical sense of approaching the infinitesimal. It is obviously impossible for this condition to be literally fulfilled. But if we are too fainthearted, we shall never undertake empirical studies. It may be possible to find cases where the changes in the quantities are sufficiently small for the ratio of prices to be approximated by the observed marginal rate of substitution. The experiments should be repeated a large number of times.

The second difficulty with this approach is that, like the transitivity condition, it represents a necessary but not a sufficient condition for the existence of a preference pattern. Knowledge of the equality of the ratio of prices and the marginal rate of substitution does not enable us to construct a preference function. But it is nonetheless a test of the theory of consumer's preference in much the same way as the transitivity test.

Another means of testing the theory of consumer's preference has been suggested by Samuelson.[9] This test, like the two previous ones, is a necessary consequence of the theory of consumer's preferences.

This method of testing would be based on a relation derived by Samuelson:

$$\sum_{i=1}^{n} p_i \Delta x_i \leq 0$$

implies

$$\sum_{i=1}^{n} (p_i + \Delta p_i)\Delta x_i < 0.$$

Here the $p$'s and $x$'s are used in the same way as before and the $\Delta$'s indicate finite changes in prices and quantities. It may be noticed that this condition makes use only of objective price and quantity data. This condition was deduced by Samuelson from the ranking properties of preference functions and is, consequently, a necessary condition for the existence of preference functions.

A test based on Samuelson's condition could be more comprehensive than the tests suggested previously, in that it could embrace all the goods that the consumer purchases. No doubt in an actual experiment this condition would have to be relaxed in the cases of extremely minor and incidental purchases.

[9] Samuelson, *op.cit.*, pp. 109–11.

V

Thus far, none of the tests that have been discussed have been designed to achieve the ultimate goal of an actual representation of the preference pattern of a consumption unit. Actually, the tests proposed would serve to check the theory without affording methods of obtaining consumer's preference patterns. Some tentative suggestions for methods of obtaining preference patterns will now be offered.

The problem can be approached by describing an experimental situation; it should be understood that experimental method and technique are ignored in this description and hence the actual experiment would not be so crude as the one described here. Suppose the subject or subjects of the experiment were confronted with a number of collections of goods and were asked to rank the various collections according to their desirability. We might find that several indifference classes occurred in the ranking; that is, within each such class the subject would have no preference between the collections ranked therein. If these indifference classes did not occur, they could very likely be induced by including collections that were very similar but not identical in composition, collections that differed from each other in the quantities of a few goods in such a way that the subject is likely to find little to choose between them. Hence, groups or clusters of "near-indifference" budgets should appear in the results.

Now, if the indifference or near-indifference classes have been obtained, we need next to find some mathematical function, using the quantities of the goods as arguments that show the ranking of the indifference classes as they were given by the subject. Further, we must be able to expect this function to rank new bundles of the same goods correctly.

The statistician will instantly see a similarity between the situation described above and the situations in which statistical discriminant functions are employed. Discriminant functions are linear functions, based on samples, that assign samples coming from different populations to the correct population. Such functions enable one to assign subsequent samples to the correct population with the greatest degree of accuracy. Hence, if we consider the "near-indifference" clusters derived from experiments as analogous to samples, we have a clear transfer of the discriminant function method to the problem at hand. From the computational standpoint, discriminant functions are very similar to ordinary least-squares regressions or "fitted curves," but the theory is rather different.[10]

The theoretical basis of discriminant functions depends on maximizing the ratio of the difference between sample means to the variance. This process can be made to yield a discriminant function of the type

$$U = \sum_{i=1}^{n} b_i x_i. \tag{1}$$

Here the $x$'s are the quantities of the various goods in a particular budget, $U$ is the ranking of the budget, and the $b$'s are the coefficients computed from the experimental budgets.

[10] A resume of the theory and use of discriminant functions is given by M. G. Kendall, *The Advanced Theory of Statistics*, Vol. 2 (London: Griffin & Co., 1946), pp. 341–8.

The $b$'s are found by means of the equation

$$b_j = c \sum_{i=1}^{n} d_i a^{ij}. \tag{2}$$

In (2) the $d$'s represent the differences between the sample means, the $a$'s are the elements in the inverse of the variance-covariance matrix and $c$ is an arbitrary constant.

The computational process involved will be illustrated by an example based on hypothetical data. It will be apparent that a very simple case is being considered in this example.

We assume that a subject has divided ten budgets into two near-indifference clusters. There are three goods in each budget shown by the $x$'s. The number of units of each good is shown below:[11]

| | *Non-Preferred Cluster* | | | | *Preferred Cluster* | | |
|---|---|---|---|---|---|---|---|
| | $x_{i1}$ | $x_{i2}$ | $x_{i3}$ | | $x_{p1}$ | $x_{p2}$ | $x_{p3}$ |
| $X_1$ | 3 | 4 | 10 | $X_6$ | 4 | 8 | 20 |
| $X_2$ | 3 | 5 | 12 | $X_7$ | 5 | 9 | 17 |
| $X_3$ | 4 | 5 | 8 | $X_8$ | 6 | 9 | 15 |
| $X_4$ | 5 | 4 | 6 | $X_9$ | 7 | 8 | 18 |
| $X_5$ | 2 | 7 | 15 | $X_{10}$ | 3 | 12 | 17 |
| | — | — | — | | — | — | — |
| | 17 | 25 | 51 | | 26 | 46 | 87 |

The "sample" means for the preferred and non-preferred clusters respectively are:

$$\begin{aligned} \bar{x}_{i_1} &= 3.4 & \bar{x}_{p_1} &= 5.2 \\ \bar{x}_{i_2} &= 5.0 & \bar{x}_{p_2} &= 9.2 \\ \bar{x}_{i_3} &= 10.2 & \bar{x}_{p_3} &= 17.4 \end{aligned}$$

The differences of the sample means, used in equation (2), are:

$$\begin{aligned} d_1 &= 1.8 \\ d_2 &= 4.2 \\ d_3 &= 7.2. \end{aligned}$$

The variance-convariance matrix is:

$$A = \begin{bmatrix} 22.1 & 6.7 & 16.6 \\ 6.7 & 60.9 & 85.2 \\ 16.6 & 85.2 & 191.6 \end{bmatrix}.$$

The inverse of $A$ is:

$$A^{-1} = \begin{bmatrix} .04844 & .00143 & -.00483 \\ .00143 & .04349 & -.01946 \\ -.00483 & -.01946 & .01429 \end{bmatrix}.$$

[11] The author is indebted to Albert C. S. Shen of the University of North Carolina for carrying out the calculations that follow.

The elements of $A^{-1}$ are the quantities $a^{ij}$ in (2), e.g., $a^{21} = .00143$. If we now set $c$ equal to unity and substitute the appropriate $di$ and $a^{ij}$ values into (2) we obtain the coefficients:

$$b_1 = .05842$$
$$b_2 = .04512$$
$$b_3 = .01245$$

Then the linear function that ranks the budgets is

$$U = .05842\,x_1 + .04512\,x_2 + .01245\,x_3. \tag{3}$$

The coefficients of (3) may be multiplied to make the smallest ($b_3$) equal to one. Then (3) becomes

$$U = 4.69\,x_1 + 3.62\,x_2 + x_3. \tag{4}$$

If we substitute the values $\bar{x}_{i1} = 3.4$, $\bar{x}_{i2} = 5.0$, $\bar{x}_{i3} = 10.2$ into (4), we obtain

$$U = 44.25.$$

If we substitute $\bar{x}_{p1} = 5.2$, $\bar{x}_{p2} = 9.2$, $\bar{x}_{p3} = 17.4$, into (4) we get

$$U = 74.83.$$

If we substitute some intermediate values of the $x$'s, e.g., $x_1 = 4$, $x_2 = 7$, $x_3 = 15$, into (4) we get

$$U = 59.10.$$

Hence, we have a function with the power to discriminate between the satisfactions arising from budgets involving the goods $x_1$, $x_2$, $x_3$.

The discriminant process may be extended to experiments involving more than two indifference clusters. In this case an arbitrary numerical scale for $U$ must be assumed, but it is clear that this is compatible with the ordinal theory of utility. The calculation for three or more clusters is analogous to ordinary regression calculations. Of course, more than three goods may be included in each budget.

Standard errors for the $U$ values may be found by use of the formula

$$\sigma_U = \sqrt{\frac{\sum_i \sum_j b_i b_j a_{ij}}{n}}. \tag{5}$$

In (5) the $a_{ij}$ are the elements of the matrix $A$, and $n$ is the number of degrees of freedom. In the present example there are six degrees of freedom and $\sigma_U = 20$.

While linear equations such as (4) serve to rank the budgets as to their desirability to the consumer, they are not "well-behaved" preference equations. They do not submit to all of the conditions imposed by the theory of consumer's preference. For example, with equations such as (1), the equilibrium condition for a consumer for any two goods is:

$$\frac{b_i}{b_j} = \frac{p_i}{p_j}, \tag{6}$$

where the $p$'s represent prices. Since the $b$'s are constants, it is clear that, with any diversity of individual tastes, price movements can only be of a restricted type, if consumers are to reach equilibria. Hence, a linear preference function imposes unrealistic conditions.

To overcome the difficulties for testing utility theory that are implied by a linear preference function we may use the equation:[13]

$$U = x_1^{b_1} x_2^{b_2} \cdots x_n^{b_n}, \tag{7}$$

which is also well suited to statistical fitting. The statistical work can be accomplished by using the same formulae as in the linear case after converting the data to logarithms. If (7) is transformed to logarithms it becomes:

$$\log U = b_1 \log x_1 + b_2 \log x_2 + \cdots + b_n \log x_n. \tag{8}$$

Since the right member of (8) is a function linear in the logarithms of the $x$'s, the statistical work proceeds as before after the data values have been changed into their logarithms. If this process is carried out for the hypothetical data used before, the result is:

$$U = x_1^{.8711} x_2^{.7386} x_3^{.3065}. \tag{9}$$

Preference equations such as (7) or (9) are more tractable for purposes of testing utility theory than are linear equations such as (1) or (3). For example, for a preference equation of the type of (7) the consumer's equilibrium condition for any two goods is

$$\frac{b_i x_j}{b_j x_i} = \frac{p_i}{p_j}. \tag{10}$$

Even though the $b$'s are constants this is not nearly so restrictive a condition as (6), the corresponding condition for linear preference equations. Hence, for an equation of the type of (7) or (9) an empirical test of the theory of consumer equilibrium might be undertaken.

It is obvious that an equation such as (7) or (9) meets the much discussed integrability condition, i.e., that

$$\frac{\partial^2 U}{\partial x_i \partial x_j} = \frac{\partial^2 U}{\partial x_j \partial x_i}.$$

There are difficulties in the use of equations of the type of (7). For example, if any one of the $x$'s is zero $U$, the preference index, is zero. Preliminary investigation suggests that this difficulty is not insuperable, but might be overcome by restricting the range of values that the variables are allowed to assume or by

[13] For a discussion involving this type of preference equation see L. R. Klein and H. Rubin, "A Constant Utility Index of the Cost of Living," *Review of Economic Studies*, XV (1948–49), pp. 84–7. P. A. Samuelson, "Some Implication of 'Linearity,'" same journal, same volume, pp. 88–90.

using additional terms. In any case, it seems likely that continued experimentation would suggest amended or alternative forms for the preference function.

Equations of the type of either (4) or (9) obtained from actual rather than hypothetical data could be used to test the transitivity axiom. Similarly, they could be used to test the non-satiety assumption and to investigate the nature of inferior goods. The chief test of the equations themselves would be their accuracy in ranking budgets not included in the original data.

# CONTINUOUS AND DISCONTINUOUS FACTOR SUBSTITUTION

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It is well known that moderate changes in input price ratios lead to moderate substitution among inputs under traditional variable proportions assumptions. When technology requires that inputs be combined in fixed proportions in a given production process it has commonly been said that input proportions are independent of price. However, when more than one technical process exists for attaining a given objective (this must be the most common case), factor substitution is again possible. When applicable, programming techniques can be used to specify the circumstances under which such substitution will take place. In the linear case, substitution may be termed "discontinuous," but the traditional "continuous" variety may be obtained under other assumptions.

The argument will be presented here without the use of algebra,[1] in a form easily compared with modern diagrammatic presentations of the marginal theory of production. We make the usual programming assumptions:

(1) that the firm is a net revenue maximizing unit,
(2) that in any given process the inputs must be combined in technically fixed proportions,
(3) that more than one process exists, and
(4) that the total product of any number of processes used simultaneously is the sum of the products of the individual processes used separately at the same levels.

In the initial case we also make the assumptions associated with linearity:

(5) input and output markets are perfect and
(6) each process can be carried on at any level, fractional or otherwise, with output proportional to the quantity of each (any) factor required—in short, constant returns to scale.

## THE PROGRAMMING ANALYSIS

To apply programming techniques to the study of factor substitution we specify the particular factors we wish to study, and assume that for each the quantity available to the firm is effectively limited. The remaining factors are assumed to be available without limit at constant prices. Here we assume that there are two limited factors, I and II, and five technical processes. Points $P_1, P_2, \cdots, P_5$ in Figure I are "unit level" points for each process. They represent the quantities of the limited factors required to yield a net revenue of \$100 after deducting from the total sale value of the product(s) of each process the value of the non-limited factors used. If adjacent processes are used simultane-

[1] For an analytical presentation see Robert Dorfman, *Application of Linear Programming to the Theory of the Firm* (Berkeley, Calif.: University of California Press, 1951).

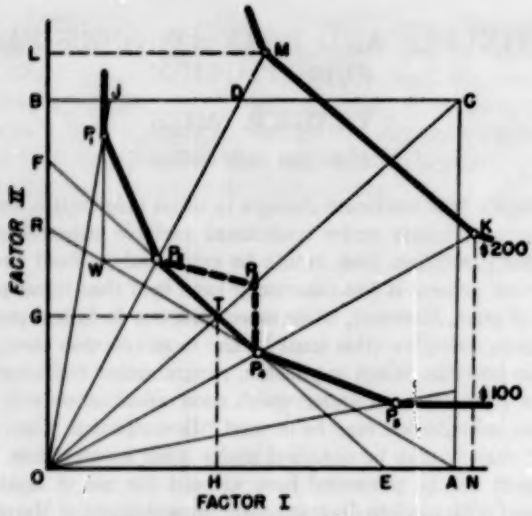


FIG. I. PROFIT MAXIMIZATION UNDER LINEAR PROGRAMMING

ously, the $100 net revenue points form the solid line $P_1 P_2 P_4 P_5$ and the dotted line $P_2 P_3 P_4$.[3] However, the dotted line represents combinations of the limited factors that are "inefficient": the same net revenue can be had (on $P_2 P_4$) by using less of one factor without using more of the other. It is apparent from the diagram that only adjacent processes can enter into efficient combinations and that an inefficient process (like $P_3$) cannot be a part of an efficient combination.[5] A corollary of the first proposition is that the number of processes in an optimal production programme will never exceed the number of limited factors.

The highest net revenue attainable with the limited quantities $OA$ and $OB$ of factors I and II lies on the "isoquant" (not drawn) which runs through point $C$. It is obtained by using two processes in the proportions indicated at $T$. Carrying on process $P_2$ at unit level and $P_4$ at 7/5 unit level exhausts the stocks of the limited factors and yields a net revenue of $240 (measured by $OC/OT$).[6]

If the quantity of factor I available had been less than $BJ$, some of the $OB$ units of factor II would have had to be discarded. The vertical section of the $100 net revenue contour represents combinations of process $P_1$ with a costless "disposal process" which eliminates any excess of factor II over the quantity required to carry on $P_1$ at unit level. The horizontal section of the contour represents combinations of $P_5$ with a disposal process for factor I.

These horizontal and vertical sections of the revenue contours consist of in-

[3] Robert Dorfman, "Mathematical, or 'Linear,' Programming: A Nonmathematical Exposition," *American Economic Review*, Vol. 43 (1953), pp. 804-807.

[5] The line connecting adjacent efficient processes always lies nearer the origin than a line joining non-adjacent processes or connecting with an inefficient process.

[6] *Op.cit.*, pp. 810-813.

efficient points, since the same revenue may be had by using less of the factor being disposed of without using more of the other factor. In this case "inefficiency" does not involve economic waste, as the excess of the factor being disposed of has no alternative use. An optimal programme can be an inefficient combination,[5] but only where the "inefficiency" is in the use of a factor which is not scarce.

## DISCONTINUOUS FACTOR SUBSTITUTION

Now how may we use this analysis to study price-induced substitutability between factors I and II?

In order to define a maximum net revenue position we have assumed these factors to be available in certain fixed quantities. But suppose the opportunity to alter these quantities should exist (or arise). At what factor-price ratios would there be no incentive to alter their proportions and at what ratios would substitution be desirable? The solution portrayed in Figure I contains implicitly the answer to these questions.

Let us take the net revenue maximizing programme to be a mixture of processes $P_2$ and $P_4$, as shown in Figure I. Draw the price line[6] $EF$ tangent to $P_2 P_4$.[7] Now $EF$ defines a factor price ratio $p_1/p_{11}$, equal to $OF/OE$. At this ratio there is no reason for altering the proportions of the limited factors, for there is no way of obtaining a larger net revenue than \$100 for the expenditure implied by the line $EF$. At the same time there is no reason for *not* altering factor proportions as long as we do not reduce the ratio of factor I to factor II below $LM/OL$ or raise it above $ON/NK$. At the factor price ratio $OF/OE$ factor proportions are indeterminate (the elasticity of factor substitution is infinite) within the range bounded by $LM/OL$ and $ON/NK$. At this factor price ratio processes $P_2$, $P_4$, and any combination of these two are equally profitable as long as factors I and II are obtained in the proportions required. Perhaps this phenomenon helps to explain the empirical observation that firms using quite different production techniques often coexist in the same industry for long periods of time.

Indeterminacy of factor proportions exists only when the price line is tangent to the iso-revenue contour. Let the relative price of factor I fall as indicated by price line $AR$ and process $P_4$ becomes the only net revenue maximizing process. Factor proportions must equal $ON/NK$ if net revenues are to be maximized, for any factor price ratio less than $OF/OE$ but greater than the ratio which creates a price line tangent to $P_4 P_5$. The more acute the angle at $P_4$,

[5] W. W. Cooper, A. Henderson, and A. Charnes, *An Introduction to Linear Programming* (New York: John Wiley and Sons, 1953), p. 33, footnote 37. Cooper and Henderson do not place this restriction on the appearance of inefficient points in optimal programmes.

[6] Throughout this paper we shall consider the markets of the limited factors as perfect, since the perfect market case is the most familiar in marginalist writings. Adjustments in the argument to deal with the imperfect case are not difficult. Indeterminacy is reduced in the linear case and increased in the increasing returns case.

[7] Since each process shows constant returns to scale it makes no difference at which iso-revenue level the price line is drawn.

the greater the change in relative prices which may occur without altering the optimal factor proportions.

Thus we alternate between a unique factor combination, optimal over a limited range of relative prices, and a unique price ratio at which the optimal factor combination is not unique (though it is limited to a certain range). As with traditional theory, the overall effect is the substitution of factor I for factor II as the relative price of factor I falls. But this substitution is "discontinuous": there are certain ranges where changes in price ratios induce no change in factor proportions, but as the price ratio moves from one of these no-substitution ranges into the next, substitution must take place if the optimal factor proportion is to be attained. The boundaries between these no-substitution ranges we shall call the price-substitution boundaries.[8] Under the variable proportions assumptions of marginal theory substitution is "continuous": each change in price ratios induces some change in proportions; there are no "corners" at which the changes come suddenly (discretely). Moreover, since the assumption of diminishing marginal rate of technical substitution is made for all points on the isoquant there is one and only one factor proportion along a given isoquant which is consistent with a particular price ratio.

In the linear programming case the range of discontinuity in factor substitution is reduced whenever new processes appear which render mixtures of old processes inefficient, but do not render any pure processes inefficient which were previously efficient. Suppose that such a new process point lies to the left of $T$ in Figure I. Instead of the straight-line segment, $P_3\ T\ P_4$, we would have two shorter segments, approximating an arc drawn convex to the origin between $P_3$ and $P_4$. The range of insensitivity to price changes would be reduced, since the angles at $P_3$ and $P_4$ would be less acute, and the amount of change in factor proportions when change does occur would be less, since the new process is intermediate between $P_3$ and $P_4$.

If we choose new process points in such a way as to exhaust the possibilities for introducing such processes (without destroying the efficiency of any old processes), the result is the continuous convex isoquant of traditional variable proportions theory. The number of efficient processes is now infinite; for each possible factor proportion there exists an efficient process. But note that we do not obtain the traditional marginalist case simply by increasing the number of efficient processes without limit. Doing no more than that could have led again

[8] The price-substitution boundaries can be determined analytically for any number of factors, simply by considering them all as limited. For each set of proportions among the limited factors there exists a face of the iso-revenue surface which gives the factor-price ratios representing the tangency positions. By appropriate choice of several sets of proportions the slopes of each face of the surface can be attained, thus enabling us to define all of the price-substitution boundaries.

Similarly, factor-product or product-product price substitution boundaries can be marked out, as long as at least one factor or product is left variable. Diagrammatically, in the factor-product case, let our Factor II axis become the Product axis and our $P_1P_2 \cdots P_5$ curve would become a positively sloped angular total product curve, convex upward. In the product-product case the $P_1P_2 \cdots P_5$ curve would become an angular transformation curve, concave to the origin.

to the identical angular iso-revenue curve of Figure I. Moreover, since we have assumed constant returns to scale for the individual process our variable proportions production map will also be limited to the constant returns case.

## INCREASING RETURNS

Three features of the linear programming results are altered when we move to certain non-linear cases. The role of the mixture of two or more processes changes; indeterminacy with respect to the optimal proportion of factors I and II is reduced; and under decreasing returns factor substitution may sometimes be continuous.

A non-linear relationship between net revenue and fixed factor utilization in a particular process may result from (1) a changing price for the product as output expands, (2) changing prices or quality of the variable factors as their use expands, (3) a changing ratio between physical output and inputs at different levels of the process, without altering the proportions between the inputs, and (4) changes in the proportions in which the several inputs are combined as the level of the process expands.[9] In addition, (5) whenever the net revenue from one process at a certain level depends upon the level at which another process is carried on, the results of carrying on the two processes simultaneously cannot be obtained by simple addition, and another nonlinearity is introduced into the problem. Instances of the last phenomenon occur in imperfect markets, when processes compete with each other for certain variable factors or for markets for related goods; there may also be some technical relationships of this sort. Our discussion here is limited to non-linearities of the first three sorts. We continue to use the assumptions that the proportions of the inputs to each other are fixed and that returns in each process are independent of the level of activity of any other process.

We need first a method of constructing net revenue contours when individual processes are characterized by increasing or decreasing returns to scale. Figure II shows how this may be done.

The revenue obtained by combining processes $P_2$ and $P_3$ may be determined as follows. Construct lines parallel to the vector (ray) $OP_2$, having their origins along the vector $OP_3$. Each intersection in this grid represents the net revenue indicated by the sum of the distances along the grid to that point. Thus point $U$ represents \$200, \$100 from $OP_2$ of process $P_2$ and \$100 from $P_2U$ $(=OP_3)$ of process $P_3$. Point $V$ represents \$300, \$100 from $OP_2$ of process $P_2$ and \$200 from $P_2V$ $(=OP'_3)$ of process $P_3$. (Note that when we do not have constant returns equal distances do not measure equal dollar amounts, even along a single process vector).

[9] Such non-linear relationships within the individual process may not exist under Dorfman's definition (Dorfman, *Application of Linear Programming to the Theory of the Firm*, p. 15). I prefer to consider as separate processes any productive events that combine inputs and outputs in different proportions at some level of output of one of the products. Under Dorfman's definition, if a non-linear relationship exists, every different level must be considered a different process. This could be a useful device for purposes of linear approximation to non-linear cases.

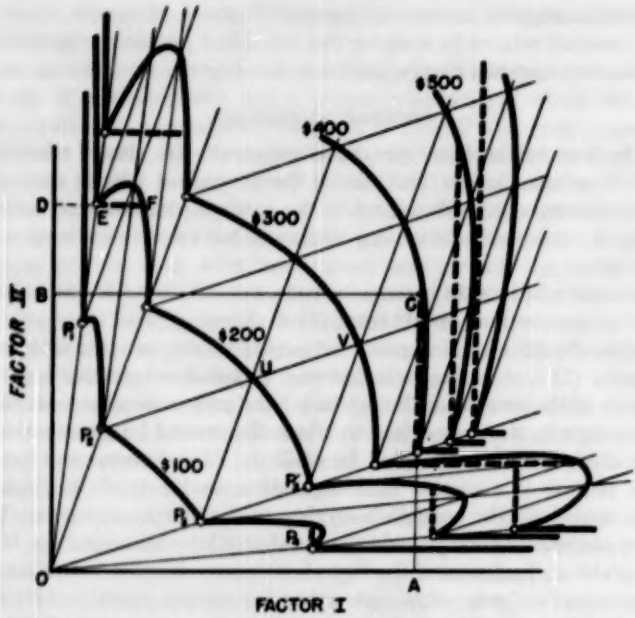


FIG. II. CONSTRUCTION OF NET REVENUE CONTOURS IN THE NON-LINEAR CASE

The complete revenue contours (the solid lines) show what revenue would be obtained by actually using in production the quantities of the limited factors indicated by each point. Certain segments of them are inefficient, for instance point *F*: *DF* of factor I yields no more revenue than the smaller quantity *DE* when used with *OD* of factor II. A quantity of factor I a little smaller than *DF* would actually yield less revenue than *DE*, if all of it were used in production. The optimum programme would discard the excess over *DE*. With exactly *DF* of factor I available, two programmes are optimal. The one which uses *DF* is an "inefficient" combination, but involves no economic waste since no alternative use for *EF* of factor I exists which has a net revenue greater than zero. The heavy dashed lines in the figure cut off the inefficient segments, except for the extensions parallel to the axes that represent the inclusion of disposal processes.

Figure II represents the case of increasing net returns: on each process ray successive $100 increments may be had by smaller and smaller additions to the consumption of the limited factors. Figure III is the same diagram after elimination of the grid used in construction and all segments of revenue contours that represent inefficient combinations (except for the extensions parallel to the axes which represent the use of disposal processes). A job-lot firm in which set-up-time and learning time are important for each process separately might have net revenue contours like these.

The contours are concave to the origin in the ranges representing mixtures of active processes because returns are increasing to the individual process but not

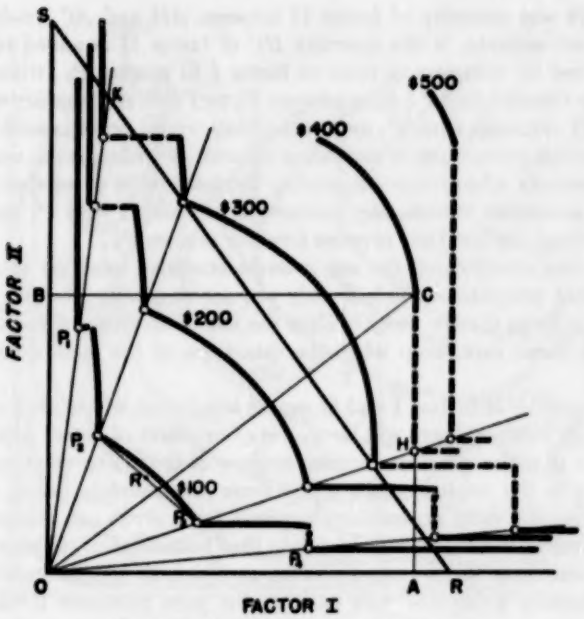


FIG. III. INCREASING DOLLAR RETURNS

to the sum of the processes. If \$50 of net revenue could be obtained by using half of the limited factors required to get \$100 through process $P_3$ and half of those required for \$100 through $P_2$, the \$100 contour would pass through $R$ in the straight line $P_2 P_3$. Because it takes more than half of the limited factors to get \$50 in each case, the \$100 contour passes to the northeast of $R$.

A complication which does not appear with *linear* programming is the possibility that mixtures of non-adjacent processes may in some ranges be more efficient than mixtures of adjacent processes. The contours drawn in Figure IV represent only mixtures of adjacent processes. In this case these happen to be the most efficient mixtures within the quantities of the factors available. However, if the \$500 contour is drawn for a mixture of processes $P_1$ and $P_3$ it will lie southwest of the \$500 segment in the figure. If sufficient quantities of the fixed factors were available to reach the \$500 revenue level the $P_1 P_3$ combination would supplant the $P_2 P_3$ mixture in this range, since the rate of increase of returns is much higher for process $P_1$ than for $P_2$.

In Figure III the maximum revenue attainable is \$400. It can be had either by using process $P_3$ at the \$400 level (point H) or by following programme $OC$, calling for perhaps \$270 from process $P_2$ and the remainder from $P_2$.[16] The dotted portion of the contour between $H$ and $C$ indicates that using $OA$ of

[16] We can no longer assume that the mixture of processes indicated by such a line as $OC$ is independent of the level of the programme. To determine the mixture revert to the construction lines of Figure V.

factor I with any quantity of factor II between $AH$ and $AC$ would give less than $400 net revenue. If the quantity $HC$ of factor II is added to $AH$, this can be utilized by transferring some of factor I to process $P_2$, without loss of revenue. To transfer factor I from process $P_3$ to $P_2$ on any smaller scale would cut back net revenues from $P_3$ more than they would be expanded by adding $P_2$. We lose the advantages of increasing returns by adding small amounts of a process, especially when we must sacrifice the later units of another process to do so. For analagous reasons any mixture of process $P_4$ with $P_3$ would be inefficient, beyond the $300 net revenue level for process $P_3$.

These dotted stretches of the net revenue contours establish ranges within which efficient programmes include only one active process, leaving any excess of one factor to be thrown away.[11] Thus the use of mixtures of processes is less than in the linear case, even when the quantities of the factors are predetermined.

If the quantities of factors I and II can be selected at will in such a way as to maximize net revenue, there will be no use of mixtures of active processes. The combination of active processes creates sections of the net revenue curves which are concave to the origin (except where there are complete gaps), so one can always reduce the total expenditure required for a given net revenue level by moving to one of the single process points that bounds each concave region.

In the linear case there are price ratios at which an infinite number of mixtures are equally profitable with each of the pure processes involved. Indeterminacy of factor proportions cannot occur from this cause in the increasing returns case, since here mixtures are inferior to pure processes. The only indeterminacies which remain occur when there are two or more optimal process points on the relevant factor price line.[12] Price line $SR$, in Figure III, passes through two equally desirable points,[13] $P_2$ and $P_3$, but in this case they are not optimal. Here process $P_1$ is optimal, and the factors must be obtained in these proportions in order to maximize net revenue at this expenditure level.

Now what about price-induced substitution? No fall in the relative price of factor II can lead to further substitution in its favor, as $P_1$ already uses this factor in the greatest proportion technically possible. However, a fall in the relative price of factor I will induce substitution if the change is large enough. Let $SR$ swing counterclockwise, pivoting on point $K$, which represents the optimal factor combination for the original $SR$. There will be a range in which no change in process is indicated, but at some point process $P_3$ will become preferable[14] and a marked change in factor proportions be indicated. Factor

[11] It can be seen from Figure III that these gaps in the revenue contours are particularly important with respect to those processes for which returns increase the most rapidly and at those levels at which the advantages of increasing returns have become marked.

[12] There cannot be more such points than there are processes.

[13] They need not remain equally desirable at all expenditure levels, since we have not imposed the condition that increasing returns shall operate proportionally on all processes.

[14] $P_3$ is skipped over in this case because the advantages from increasing returns are so much greater in process $P_3$. It is possible that the strength of the increasing returns influence in $P_3$ so far exceeds its strength in $P_4$ that no fall in the price of factor I will bring a shift from $P_3$ to $P_4$ except for levels of expenditure much below $OS$ (in terms of factor II).

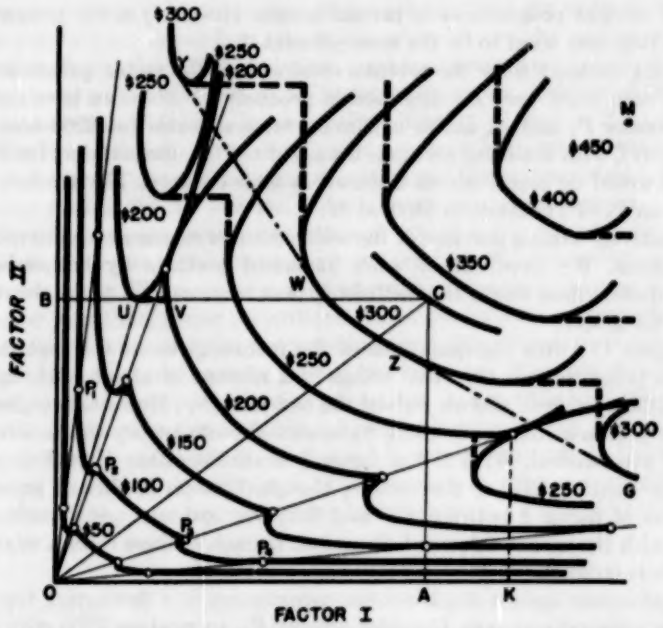


FIG. IV. DECREASING DOLLAR RETURNS—MIXTURES LIMITED TO TWO PROCESSES

substitution under this type of non-linearity is discontinuous, as with linear programming, with one difference. Here there is less chance for substitution to take place without a change in the price ratio, for indeterminacy has been reduced.

### DECREASING RETURNS

Whereas increasing net returns to the process leads to a preference for single process programmes, decreasing net returns leads to a preference for mixed programmes. Diminishing net dollar returns result when expanding output brings (1) a fall in the product price or prices, (2) a rise in variable input prices or a fall in their quality, or (3) a fall in the ratio of product to factors (without affecting the proportions among the factors). A rise in the requirement of variable factors per unit of limited factor is the same as category (2), as long as the proportion between the limited factors is not affected. It is assumed that for each process these effects are independent of the levels of other processes.

Figure IV shows the net revenue contours for a firm subject to diminishing dollar returns and limited to the use of no more than two processes at a time.[18] As with increasing returns, it is possible that non-adjacent processes may form

[18] We shall remove this limitation later. Its use is one way in which a limiting factor not readily allocable to specific processes may be introduced into the problem. An example is supervisory talent which is inadequate to handle more than two processes.

the most efficient programmes in certain ranges. However, in the present case adjacent processes seem to be the more efficient.[16]

The solid contours show the revenue obtainable if the factor quantities indicated by each point were actually used in production.[17] Since we have assumed that processes $P_3$ and $P_4$ attain maximum revenue levels (at \$200 and \$250, respectively), with declining revenues if pushed too far, the contours for $P_2$ - $P_3$ mixtures would be closed curves if drawn in their entirety. The absolute maximum from $P_2$ - $P_3$ mixtures is \$450, at $M$.

All positively sloping portions of the solid contours represent inefficient factor combinations. We have cut off such inefficient portions by horizontal and vertical dashed lines where the inefficiency was large enough to be clearly evident on the graph.

In Figure IV, with the quantities of the factors given at $OA$ and $OB$, the optimum programme is $OC$. This brings in a revenue of about \$335, approximately \$195 of it from process $P_3$ and the rest from $P_2$. Had smaller quantities of factor I been available, $C$ would have moved continuously to the left, until point $V$ was reached. With $BV$ of factor I available, either $U$ or $V$ represent optimum combinations of the factors, though $V$ is an inefficient point. For quantities of factor I between $BV$ and $BU$, the optimum programme would be $OU$, with the excess of factor I discarded. In each of these cases a mixture of processes is optimal.

This prejudice against single-process programmes is a distinctive feature of the decreasing returns case. Consider process $P_3$: to produce \$250 with $OK$ of factor I requires less of factor II if a mixture of $P_3$ and $P_4$ is used than if $P_3$ alone is used. Apparently the only single process programmes that are efficient consist of processes at the technical extremes ($P_1$ or $P_4$), and it can be shown that sometimes even those are inferior to mixed programmes plus a disposal process. However, we shall not take space for that here.

Another peculiarity of the decreasing returns case is the convexity of the several segments of the revenue contours. This characteristic, which accounts for the discrimination against single-process programmes, represents the possibility of partially avoiding the effects of diminishing returns by mixing processes.

## CONTINUOUS FACTOR SUBSTITUTION

With freedom to alter factor quantities at will, the mixed programme remains preferable through most, if not all, of the diagram. In building a factory one would be likely to plan for a combination of processes, even in a riskless world, for the mixed programme enables one to reduce the impact of diminishing returns. But the mixed programme does not now necessarily mean indeterminate factor proportions, though some indeterminacy exists. Consider price line $YW$.

[16] Mixtures involving processes that are inefficient at unit level may sometimes be superior to programmes excluding such processes. We assume here that no processes exist except those shown on the diagram.

[17] Except that where mixtures involve disposal processes (to the left of $OP_1$ and to the right of $OP_3$), the solid line is used.

Either programme $Y$ or programme $W$ is optimal; there are two sets of optimal factor proportions, depending upon whether we choose the mixture of $P_1$ and $P_2$ at $Y$ or $P_2$ and $P_3$ at $W$. Now let the price line rotate slowly counterclockwise, sliding down as it rotates so as to maintain tangency with the \$300 revenue contour between $W$ and $Z$. Immediately a mixture of $P_2$ and $P_3$ is preferred; between $W$ and $Z$ the mixture is uniquely determined; to each factor price ratio there corresponds one and only one set of optimal factor proportions. When the price line reaches the $ZG$ position, a double optimum again appears.

Although there are some price ratios at which factor proportions are indeterminate, there are no factor proportions for which the appropriate price ratio is indeterminate. There are no ranges where price change can occur without an alteration in optimal factor proportions; factor proportions are never insensitive to factor price ratios at a given net revenue level. Discontinuous factor substitution caused by non-response to price ratios has gone. The only discontinuities remaining are the sudden jumps in optimal factor proportions that occur when, for instance, the price line shifts from being a bit steeper than $YW$ to a bit less steep. Between such points as $W$ and $Z$,[18] however, substitution is continuous, just as in traditional marginalism. Small changes in price are associated with small changes in factor proportions, and vice versa.

## ANALOGS FOR MARGINALISM

With constant or increasing returns there was no need for an assumption limiting the number of processes to be combined, for no more processes could be profitably mixed than there were factors. Under decreasing returns the possibility of partially avoiding the diminution of returns encourages the addition of processes in excess of the number of factors. Indeed the absolute maximum level of net revenue can be had only by using all processes in existence, each at its own maximum level.

If we permit three adjacent processes to be combined in Figure IV, the middle segments of the contours are moved toward the origin. More important for the influence of prices, the new contours bridge the gaps across process vectors $OP_2$ and $OP_3$ with smooth curves convex to the origin. Graphic experimentation suggests that the new contour pattern will be convex to the origin at most points, if not at all. Adding the fourth process may shift parts of some contours still farther to the left, depending partly on the level at which the other processes are being used. It may even be desirable at times to add the initial stages of "inefficient" processes[19] if the others are already being pushed quite far.

In general, being free to add processes to the mixture eliminates the significant discontinuities and concavities, and the situation becomes substantially that of marginalist theory. In general, to each set of relative prices there corresponds a single optimal ratio of the limited factors, and vice versa. Factor substitution becomes generally continuous.

[18] I have only shown this continuous range for the \$300 contour.

[19] "Inefficient" on the basis of a comparison of unit level returns.

A still simpler model which substantially reproduces traditional marginalism with decreasing returns to scale is the decreasing returns programming case where only two processes exist.[20] The portion of Figure IV between the $OP_2$ and $OP_3$ rays shows the appearance of such contours. They are convex to the origin, turning back to form closed contours at and beyond the maximum revenue point for the single process, and terminating in straight lines parallel to the axes at net revenue levels below this maximum. The marginalist case is perfectly reproduced except in one or two minor respects.

Those marginalists who wish to assume that the marginal rate of substitution between the factors never becomes zero or infinite will not be satisfied at the points where the contours turn back or become straight lines. However, closed contour systems are common among marginalists, and unless we wish to limit marginalism to dealing with such broad categories as "labor," "land," or "capital," we will have to admit that the marginal rate of substitution does sometimes become zero or infinite. There are cases where additions of a particular input, beyond a certain point, no longer permit the release of certain other inputs. If input classes are many and narrow one wonders whether these are not the general cases.

A more substantial defect which sometimes appears is that there may be some cases in which the marginal rate of substitution does not move continuously to zero (or an infinite value) as the straight-line sections are approached. In such cases there would be a limited range of factor-price ratios, short of zero or infinity, in which optimal factor proportions would be unresponsive to price change (and in which the optimal programme would be a single process programme).

The special assumption that the two processes available are (1) produce by the use of factor I only and (2) produce by the use of factor II only, though it may seem to have no empirical counterpart, provides an unusually neat version of the variable proportions case. The contours are continuous throughout their range, differing from the conventional variable proportions diagram only to the extent that at their ends they become coincident with the axes rather than asymptotic to them. That is, this model assumes that continuing substitution will end with the elimination of one of the factors; textbook marginalism usually assumes that some of each factor must be present (though this is clearly not descriptively correct except for such broad factor classifications as "land" or "labor").

The complex shapes and discontinuities of the revenue contours in Figures III and IV are associated with the assumption that increasing or decreasing returns depend on the level of each individual process rather than the level of operation of the firm as a whole. If the returns in one process depend upon the level of activity in other processes, new possibilities appear. Such combinations are possible as increasing returns to the individual process, but with the level of net revenue negatively associated with the level of other processes. Some of these interrelations simplify the contour pattern. Where non-constant returns are associated with the level of operation as a whole rather than the level of individual

[20] More generally, as many processes as there are limited factors.

processes, the single process ceases to be either favored or discriminated against. The cusps (points) of the revenue contours that were located along the process vectors in Figures II, III and IV are no longer evident.

In the special case in which the ratio of net returns to utilization of the limited factors depends upon the level of combined net revenues rather than the level of an individual process the revenue contours revert to the jointed straight lines of Figure I. The results are like those of the linear programming case, with the following exceptions.

(1) Since $100 revenue differences no longer are represented by equal distances from the origin along programme vectors, the level of revenue *cannot* be measured by the ratio $OC/OT$; the labels on the revenue contours must be used.

(2) With decreasing returns an absolute maximum of revenue may be reached before both of the limited factors are fully utilized. If so, there is a range of "short-run" optimal programmes yielding the same revenue. At one extreme factor I is fully utilized and the excess of factor II disposed of; at the other extreme factor II is fully used; in between some of each factor is thrown away.

## SUMMARY

If all factor commitments are subject to change, fixed technical proportions usually mean that within certain ranges changes in the relative prices of the factors will have no effect on the proportions in which they are combined; however, once critical points are passed factor combinations will be altered considerably. If the result of each process is unaffected by the level of other processes, optimal programmes tend to be single process programmes when all factors are adjustable and there are increasing returns. The decreasing returns case tends toward mixed processes with all factors adjustable and may result in continuous factor substitution over a considerable range. Constant returns may have either mixed or single process programmes, but mixed programmes are compatible with only a finite number of specific price ratios, while single process programmes are consistent with all other price ratios.

# CAPITAL BUDGETING AND THE ALLOCATION OF RESOURCES*

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One must agree with Mr. Jesse Burkhead[1] that among contemporary policy-makers there is a strong inclination to reject the logic of dynamic fiscal policy and to accept the balanced budget as a guiding principle. The scholarly literature is guilty of no such cultural lag. An excursion in contemporary economic journals reveals no denial of the efficacy and desirability of public deficit as an offset to depressed private investment anticipations. Dynamic, compensatory or functional fiscal policy, call it what you will, in some form or another is the contemporary fiscal orthodoxy of economists.

Perhaps because it is the orthodoxy, it no longer is the subject of much scholarly conjecture. The period from 1938 to 1941 abounded in comment concerning the consequences of public debt, and related formulations of fiscal theory and policy dictates. Since World War II, however, even those economists who contributed most importantly to the discussion apparently judge that the topic has been explored adequately, and have moved on to other contemporary issues.

The scholarly appraisal ended short of its logical conclusion. The discussion has influenced profoundly our thinking about anti-cyclical policy. It has not considered adequately the relation of public debt to the allocation of resources among alternative uses in an economy in which cyclical fluctuations are mild because of effective use of anti-cyclical monetary and fiscal tools.

The allocative aspects of public debt creation were a central interest in early economic speculations concerning public finance. Adam Smith, Jean-Baptiste Say, and Ricardo opposed government deficits principally because they considered them likely to shut off the private economy from capital funds. Although Lauderdale and Malthus took positions similar to those of recent compensatory theorists, in the literature of 1780–1840 public deficits typically were held to be inappropriate instruments of policy because they were thought to cause inefficient allocation of resources.

There was no recant of this doctrine between 1840 and 1930. John Stuart Mill defended public debt relative to some types of private debt, reflecting his sensitivity to the less material consumer needs, which he advised frequently best could be satisfied through public action. But Mill had few supporters in this regard.[2] Bastable's comment is representative:

* A paper read at the Twenty-fourth Annual Conference of the Southern Economic Association, Biloxi, Mississippi, November 19, 1954.

[1] I am much indebted to the article of Jesse Burkhead, "The Balanced Budget," *Quarterly Journal of Economics*, Vol. LXVIII, No. 2, May, 1954.

[2] At any rate, in English. Mr. Burkhead states that the Germans dealt more flexibly with the function of public debt, but I have been unable to consult his sources.

National culture, education, the promotion of social progress are all most desirable; but their promotion is not so urgently required as to need the use of borrowing by the public powers.[3]

More intensive scholarship may uncover broader definitions of fiscal principles in the decades prior to the 1930's, but the materials reviewed justify the conclusion that throughout accepted scholarship before that time, deficits were excused only to meet non-recurrent and large government expenditures such as those entailed by war. Deficit financing in such instances was considered admissable despite its disruptive effect upon monetary experience and resource allocation because it caused less disturbance than heavy taxation. The consensus was that deficits under any other circumstances interfered unwisely with the distribution of income and activity, hampering the formation of capital, or at least diverting capital creating activities into less desirable areas than would have been pursued had equal funds been available for private investment.

Recent evaluations of fiscal policy diverge significantly from earlier concepts only in that they also would permit public deficits when the private economy is not sustaining full employment. Although the point frequently is made that when resources are not in use nearly any application of them generated by public deficit adds to aggregate output, it is not usually argued that governments should create debt as a counterpart of their capital creating activities. Galbraith has expressed the contemporary position as follows:

> . . . Government investment does compete with private investment for investment goods if full employment is reached. The orthodox view of public finance is entirely valid under such circumstances and, in fact, for the reason that it assumes full employment. Thus government spending, because it is subject to control, must make way for private investment as full employment is reached.[4]

There have been occasional dissents from the position that debt creation by government should be undertaken only to meet unusual expenses or to support aggregate demand. Since the 1930's, Sweden and other Scandinavian governments under the influence of their economists have operated on double budgets, segregating the current and capital sectors, and supporting the latter, at least in part, through debt creation in good times as well as bad. Similar procedures have been proposed for underdeveloped countries by economists of the United Nations' staff.[5] Recently, Mr. Beardsley Ruml advocated capital budgeting for the United States during a period of full employment.[6] All such approaches in-

[3] C. F. Bastable, *Public Finance* (London: MacMillan, 1922), p. 670.

[4] J. K. Galbraith "Fiscal Policy and the Employment-Investment Controversy," *Harvard Business Review*, Vol. XVIII, No. 1, Autumn, 1939.

[5] United Nations, Department of Economic Affairs, *Budgetary Structure and Classification of Public Accounts*, N. Y., February, 1951. United Nations, *Budget Management—Report of the Workshop on Problems of Budgetary Classification and Management*, Mexico City, September, 1953.

[6] "Budget Reform—Round Two," Academy of Political Science, New York, 1953. (*Commercial and Financial Chronicle*, December 3, 1953.)

volve in some form or another the distinction between "capital" and "current" expenditures, and the support of the former in whole or in part through the sale of debt irrespective of the cyclical position.

## THE CAPTIAL BUDGET

Mr. Ruml has stated succinctly the position of the supporters of capital budgeting: "Few would dispute the business-like principle that truly producing assets should be capitalized, and that the benefits realized from these assets should be paid for as they are consumed."

This is a clear break with the principles which have dominated thinking about government debt creation. Instead of an expedient, government debt creation is endorsed as an appropriate allocative action. By implication, government capital projects are given equality with private projects.

By abandoning the strict distinctions between public and private expenditures which have dominated fiscal thinking for more than a century, the capital budget approach confronts us with the need for critical re-appraisals of the "productivity" of government projects relative to private projects. The principle stated by Mr. Ruml that ". . . truly producing assets should be capitalized . . ." is a very tenuous guide. In fact, it no more than reopens the difficult problem of defining "productivity."

Mr. Gunnar Myrdal cautioned at the beginning of the capital budget discussion in 1939[7] that whether a government-owned asset creates a revenue is a poor criterion as to its social contribution. He added that this issue presented no critical difficulties in the Swedish situation, since the authorities readily set up account obligations, established interagency rental and related contracts, and thereby created an accounting equivalence to the flows of productivity and depreciation.[8] This implies that the problem is primarily semantic and can be solved by creating government instrumentalities and government accounts in sufficient numbers. Mr. Gerhard Colm, on the other hand, also writing in 1939,[9] proposed criteria based on the direct or indirect revenue creating capacity of the projects. He suggested four categories of governments' capital-type expenditures as guides to their treatment:

1. Profitable investment—self-liquidating projects directly creating their own revenues.
2. Fiscally productive investments, which by their existence tend to create government revenues. Roads, with their stimulation of gasoline tax revenues, fall in this class.
3. Indirectly productive investments, which do not directly create revenues, but provide the environment in which community resources are used more productively. Flood control projects fit this category.

[7] "Fiscal Policy in the Business Cycle," *American Economic Review*, Vol. XXIX, No. 1, Part 2, Supplement, March, 1939.

[8] I put many words, but I hope no new ideas, into Mr. Myrdal's mouth. His statement was short, but full of implications.

[9] Discussion, "The Role of Public Investment and Consumer Capital Formation," *American Economic Review*, Vol. XXIX, No. 1, Part 2, Supplement, March, 1939.

4. Non-productive projects, which do not contribute directly or indirectly to community productivity, such as armaments.

Presumably, he would consider projects of the first three classes eligible for inclusion in government capital accounts, but projects in the fourth unacceptable.

Classifications such as Mr. Colm's introduce invidious and perhaps meaningless distinctions between types of services. They effect the same limits of vision which led to the nineteenth century condemnation of all government deficits. Productivity cannot be defined in terms of direct or indirect contributions to revenue. A military installation, although not able to produce a salable service and probably at best no more than a premium for survival, may be more urgently needed and may elicit public support more readily than a toll bridge.[10] So-called "non-productive" projects frequently are more important to survival and the retention of social conditions essential to our culture than "productive" facilities.

The disturbing aspect of the foregoing line of thinking is that it offers none of the comforts of simple, mechanical criteria. If public projects are supported through debt only to the extent that they produce measurable revenues directly or indirectly, conventional accounting standards can be applied to control the magnitude of debt creation. Otherwise, debt-supported projects might appear to impose such small current costs that they would be pursued without restraint if no other standards inhibited their financing. On the other hand, projects whose total costs are supported through current taxation confront the budget-maker, legislator, and tax-payer dramatically and therefore may be subjected to a more discerning evaluation. I believe this is the line of reasoning which has led economists to give up conventional budget principles reluctantly when seeking new standards to govern capital budgeting.

But such mechanical criteria avoid rather than solve the problems of choosing among alternative government programs. Projects serve the community better or less well according to value judgments which are not necessarily reflected in revenues or in the reaction to tax bills. Adopting the capital budget would not create the need for better criteria, for that need already is acute. The pork-barrel is not a desirable arbiter over the timing and character of public projects, nor, I think, are compensatory fiscal principles alone.

The standards which govern the magnitude and character of government investment programs other than at times of less than full employment probably should be sociological as well as economic. Neither sociological nor economic principles which are usable have been formulated. Although the welfare school

[10] Note Hugh Dalton's comment, *Principles of Public Finance* (London: George Routledge and Sons, 1936), p. 8:

> The only economic test of the 'productiveness' of any expenditure is its productiveness of economic welfare, and public expenditure on education and health, for example, is often productive of greater economic welfare than private expenditure on luxuries, or even on new capital goods.

and, p. 214:

> But the simple economist . . . cannot deny that the services of soldiers, sailors and airmen, and even of armament manufacturers, may, under favorable conditions, contribute to his security and are thus in principle entitled, no less than the services of plumbers, scavengers and fire brigades, to a place in the aggregate of material 'production,' in its widest sense.

has proposed the application of the marginal utility and disutility principles, these offer nothing concrete to apply.

One approach might be to devote all or a portion of the annual increment in productivity to the creation of social over-head and other government capital. This could be achieved by selling government debt to the banking system in the quantity required to expand credit in proportion to the increment in the community's productive potential, and using the proceeds to finance government asset expansion. This would tend to hold prices stable and to distribute the benefits of progress in part through government projects instead of through a falling price level or rising factor prices.

A "practical" alternative would be to commit the increment in social insurance accounts to creation of government assets. This suggestion should appeal strongly to those who are perturbed by the "spending-up" of social insurance reserves, but would have nothing else to defend it.

Perhaps the best procedure would be to establish a catalogue of projects rated by desirability, with some given equality with private demands and the others held in reserve as tools in the compensatory fiscal kit. This would call for the application of engineering, sociological, and economic criteria together, a difficult assignment. The technical details of the cataloguing seem an executive rather than a legislative function, although final discretion might be left to the Congress. Presumably the Bureau of the Budget and other government departments already attempt such ratings, but the formulation and assignment of responsibility should be precise.

Certainly it would be important to apply the same procedures at all governmental levels. There may be many sound reasons for segregating the responsibilities for schools, roads, streets, and similar facilities from the federal government, but it is evident that an effective fiscal policy requires greater coordination of projects than now exists whether or not capital budgeting is followed.

It is doubtful whether the productivity problem with which the capital budget proposal confronts us can be resolved. A unity of social purpose which is not likely to be attained in a democracy would be required. The capital budget issue confronts us, however, with a related question which may be answered satisfactorily. Should government's capital expenditures, because they are used up over time, be financed over time?—or to put it in Mr. Ruml's phrases, should "... the benefits realized from these assets ... be paid for as they are consumed?" This question introduces the problem of the effect of government debt creation and management upon the structure of production and the allocation of resources among uses.

## THE ALLOCATIVE CONSEQUENCES OF CAPTIAL BUDGETING

At this point the analysis may prove tedious. Perhaps the tedium will be relieved by indicating the conclusions in advance of the development of the ideas. These are, first, that except in circumstances of unusually strong autonomous private investment demands, a government asset creating program unavoidably is pursued at the expense of private investment if the economy is kept operating at or near full employment.

Second, that there are levels below which government asset creation should not be reduced even during periods of full employment. Many of the projects in this irreducible body are of the "social over-head" type; for example, school buildings, roads, and atomic installations.

Third, that the allocative consequences of public projects do not stem significantly from the fashion in which they are supported, but on the whole it is easier to incorporate public capital projects in a dynamic fiscal policy if they are financed through debt than if they are financed with lumped taxation.

Fourth, that on the basis of the foregoing, there is good logic for supporting the capital budget despite difficulties which may attend its installation and pursuit.

There is a strong tendency toward at least a rough equivalence between the distribution of the flow of expenditures and the distribution of resources (measured by factor costs) among the industries producing various consumer goods and services. Similarly, at full employment there is an equivalence between the proportion of income saved and the proportion of used resources engaged in capital formation. Many industires benefit from great factor flexibility and can shift readily from production of consumer to production of capital goods. Conversions from tractors and trucks to passenger automobiles, from household to industrial plastics, and from textiles for apparel to fabrics for industrial use are examples of this flexibility. But much of the industrial structure is less flexible. Such industries as cement, heavy steel, machine tools and lumber produce capital goods almost exclusively. In many other types of facilities, equipment often is single-purposed and not easily shifted from one use to another. The levels of the production process have somewhat the same inflexibility of use. Hopper cars are not very easily converted to shipping cattle. It is possible to over-build these specialized segments of industry, thereby contributing to misdirected and unused resources even during a period of full employment.

Some distortions are unaviodable in a dynamic economy, but in an economy in which government expenditures are small relative to aggregate demand the rough equivalence between the structure of production and the allocation of income is sustained so long as savings are absorbed in investment. Consumers' preferences are fulfilled in that the proportion of their incomes which they choose to accumulate for future use is devoted to capital formation. Thus resource utilization is directed in the same proportion as income between the satisfaction of current and future consumption. If we assume that patterns of consumption do not vary extremely, that the propensity to save is relatively constant, and that advances in technology are not attended by very high rates of obsolescence, critical distortions in the structure of production are unlikely.

The conjecture which the capital budget issue introduces is whether government budgets should attempt to conform to a similar allocative procedure. To put the matter a bit differently, does government contribute to derangement of the structure of production when in a situation of full employment it undertakes capital formation without increasing debt equivalently as an offset to saving? And, as a corollary, does such a derangement, if it occurs, contribute to general economic aberrations or to the inefficient allocation of resources?

Let us examine an example which may fit the 1955–1960 period. Suppose that in a situation of full employment and strong private investment demands the government is constrained to undertake large-scale capital forming programs because of urgent needs for schools, roads, atomic, and military installations. Let us assume further that the needs are "lumpy" rather than continuous.

Since full employment already has been attained, presumably the undertakings will not be supported by sale of securities to the banking system. The government has recourse either to increased taxes, or may compete in the capital market for a share of the flow of savings.

If it follows the latter course and if central bank credit is held relatively constant, resources will be diverted from private to public capital formation unless saving increases. If the public responds to the increase in interest rates which accompanies intensified competition for capital funds by increasing savings, a desirable shift from consumption to capital formation will be achieved. But if savings do not increase appreciably, which is probably the more supportable assumption, the volume of capital formation in the private economy will be reduced to accommodate the government's program.[11] This need cause no significant structural distortions inasmuch as the government projects may be equivalent to those which would have been undertaken by the private economy. A public road may influence the flow of productivity in somewhat the same way as a private rail-line. On the other hand, if the government projects are highly specialized and not convertible to private use, the rate of expansion of the private economy will have been slowed. This is an acceptable consequence if the public projects are critically needed, as we assumed.

When upon completion of the needed financing the government withdraws from the capital market, interest rates should fall, with consequent stimulation to private investment. Since consumption probably will not have been changed during this cycle, there will be no associated increase in consumption as a stimulus to investment unless the decline in interest rates stimulates a shift from saving to consumption. Insofar as private industry has deferred investment, it may choose now to expand at an accelerated pace, replacing capital demands which government has withdrawn. If the economy conforms to this neat pattern, which is not inconceivable, there probably would be no significant disruption of the structure of production when the lumped government investment program was completed.

There would be some developments in capital markets which might be con-

[11] It will occur to the reader at this point that the government investment program may induce private investment. This is, of course, a distinct possibility. A very large road-building program generates demand for enlarged capacities in the cement, steel, and heavy equipment industries. The atomic energy facilities program has created new capital demands in the instruments and other capital goods industries. A full account of the allocative impacts of government capital formation would lead us, also, into further speculations concerning the impacts on inventories, effects upon the capital coefficient, stimuli, and deterrents to innovation, and many other matters. Others certainly will find a pursuit of these questions, perhaps in rebuttal of my analysis, will enlarge and amend my presentation beneficially.

sidered unfavorable. Bond values would fall and subsequently rise, perhaps sharply, with consequent instability of investment portfolios and attendant difficulties for the central bank and the treasury. But these problems are not directly related to the allocative problem and will not be considered in this paper.

The alternative procedure would be for government to meet the capital costs with funds raised through taxation.[12] Since our assumption is that full employment prevails and private investment demands are absorbing savings it is reasonable that the tax program initially should be focused against consumption. Thereby, however, private investment would be deterred and would decline unless autonomous demands were quite strong. If private investment began to fall, in line with compensatory fiscal principles government either would create debt or shift the tax structure to discourage saving. The path would be smoother if autonomous investment demands were strong enough to sustain private investment despite curtailed consumption, for then a desirable shift of resources to capital goods formation readily would be achieved. In any case, upon completion of the government investment program and with associated reduction in taxes, consumption should expand and provide a fortunately timed stimulus to derived private investment.

The use of taxation very likely would require greater readjustments in resource utilization than would the use of debt since consumption most likely would be reduced, then restored to its earlier level. In a program of very short duration this shift might be offset by inventory movements rather than by readjustments of output, but it is more likely that expansions of government assets would require important movements in the labor force and the use of resources.

It appears from the foregoing that a government investment program in a period of full employment might be attended by greater difficulties both as regards fiscal policy adjustments and rearrangements of the structure of production if met through taxation than if financed by expansion of public debt. I am reticent to state this as a generalization since the examples upon which it is based rely upon interrelated assumptions which frequently may not be fulfilled. I believe, however, that the relations described are more probable

[12] Obviously, there is another alternative. The projects might be financed by sale of government securities to the banking system, with a related expansion of credit. This need not result in a general price increase if community productivity were increasing rapidly. In the United States potential productivity is likely to rise at the rate of $9 billion to $12 billion annually (1950 prices) during the coming decade. A considerable expansion of government debt, therefore, need not create inflationary pressures even though savings were being absorbed in private investment. Moreover, deficit financing of public projects at the cost of some inflation might be supportable. It would "force saving." This procedure might have some advantage over taxation in that it would be less likely to deter private investment. Of course, the critical objection to the method is that it unavoidably would treat different groups inequitably. Also, it might create an unfavorable international exchange situation. I believe few economists would support it as a policy for a developed country. Economists have advocated it orally as a desirable procedure in some circumstances in under-developed countries.

than alternatives. Mr. Richard Musgrave's[13] objection that the capital budget would introduce inflexibility into compensatory policy deserves attention, but it seems to me that if the treasury and the central bank are reconciled to government competition with the private economy in the capital market, which probably is inescapable anyway, there should be no reason why functional fiscal policy should be hindered. On the contrary, it might be facilitated insofar as less tinkering with the tax structure were required.

A qualification should be appended to the generalization. In under-developed countries, in which the need for capital formation is urgent, government projects usually should be supported by taxation. In such countries curtailment of consumption generally is preferable to curtailment of private investment and is possible through taxation because strong autonomous demands will sustain private investment despite curtailment of consumption. Moreover, in an underdeveloped country new security issues if sold to the banking system or abroad will magnify exchange difficulties.

The first assumption applies to a relatively short-term government investment program. An assumption which may more nearly conform to the realities of the future is that government will sustain a rather stable rate of expansion of its assets. There would be, however, no significant difference in the situation faced here and in the first example. Government must again appraise the relative values of the assets which would be created by its programs and those private investments which might be displaced should it derive the required funds from the capital market. If it were reluctant to reduce the volume of private capital formation it would be inclined to derive the funds through taxation. But this procedure, by reducing consumption, very likely would deter private investment, also. It is difficult to visualize a program of government investment at full employment in the United States which would not infringe to some extent on private investment because of our strong propensity to save and the derived (or induced) character of much of our capital demand. Capital budgeting associated with debt financing appears, therefore, a more realistic as well as a more manageable procedure to follow than financing capital outlays through taxation.

## CONCLUSION

As we have seen, there are important objections to capital budgeting and associated debt creation.

1. Capital budgeting would require extensive revisions of budgeting procedures and account classifications. Although these would confront us with innumerable technical difficulties, none seems unsolvable. Swedish experience is available as a guide.
2. It would necessitate significant revisions of public attitudes toward government debt. This presents greater difficulties. Deeply entrenched attitudes would need to be dispelled. It might not be difficult to persuade citizens to accept the "business" principles stated by Mr. Ruml. But they would

[13] "The Nature of Budgetary Balance and the Case for the Capital Budget," *American Economic Review*, Vol. XXIX, No. 2, June, 1939.

need to be convinced, as well, that so-called "non-productive" capital undertakings deserve access to the capital market, for the "social overhead capital" which our society requires is likely to increase and become more important relative to the "productive" government asset. The fast pace of technological advance requires attending expansion of educational façilities, roads, and other public installations greater than now popularly is contemplated. Morever, increasing leisure, which may be an unavoidable consequence of our technological advances, could dictate vast public investments to provide social amenities.

3. It would demand clearer criteria for judging the desirability of public investments. The difficulties implicit here have been explored in the discussion of productivity.

These objections are less formidable, however, than the advantages which justify double budgeting. Application of the capital budget would:

1. Probably facilitate the application of functional fiscal policy.
2. Confront responsible authorities with the necessity for appraising the consequences of capital creating expenditures upon resource allocation. Even in an economy as abundantly endowed as ours, this is a most desirable objective.[14]
3. Facilitate development of a better tax system. Our current attempts to achieve equity at the same time that we use taxes functionally is unavoidably contradictory.[15] If fluctuations in government expenditures were more surely tied to variations in the magnitude of its investment undertakings, and these were supported by calls upon the capital market, principles of equity in taxation could be given primacy since the compensatory objectives of fiscal policy would be accomplished through debt policy. A practical consideration also commends this approach. Taxation has proved difficult to adapt to compensatory principles. The Congress acts slowly and is given to much compromise, so that the tax adjustment is apt to come too late and in a less vigorous form than is required. Besides, taxation is selective and unavoidably discriminatory. It scarcely can become a popular administrative instrument, whereas debt creation is aggregative in its impact, and therefore more palatable.

[14] Musgrave and Culbertson (R. A. Musgrave and J. M. Culbertson, "The Growth of Public Expenditures in the United States, 1890–1948," *National Tax Journal*, Vol. VI, No. 2, June, 1953.) indicate that total public expenditures in the United States were 20 per cent of net national product both in 1940 and 1948, and 23 per cent in 1932. Data relative to the magnitude of capital expenditures by government have not been assembled as far as I know. On the basis of various data I judge that during the past 25 years, possibly excepting 1941–1944, no more and possibly somewhat less than 20 per cent of total government expenditures in the United States have been devoted to asset creation. This suggests that government capital formation has with some consistency absorbed a bit less than four per cent of the net product, which is a significant proportion capable of important allocative consequences.

[15] I consider the conflict of the principles of equity with principles of fiscal policy in an article prepared for *The Southwestern Social Science Quarterly*.

# STATE WHOLESALE TRADE EARNINGS, 1948*

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The average annual earnings of the 2,152,000 wholesale trade employees in the continental United States as reported in the *Census of Business, 1948* was $3,357.[1] Among the states the average annual earnings of this group varied from $2,456 in Mississippi to $4,076 in New York. In part, this variation among the states is accounted for by the state differences in the kind-of-business composition of wholesale trade. Each kind-of-business has its own requirements for various skills or occupations. In part, it is to be accounted for by state differences in average compensation for essentially similar skills.

The purpose of this paper is two fold. First, an effort will be made to the extent permitted by the data collected in the *Census of Business, 1948* to separate for each state that part of the total difference between the state and United States average annual earnings which may be attributed to the state's kind-of-business composition from that part which may be attributed to differences in wage rates. Secondly, the contribution of wholesale trade earnings to the differences in state per capita incomes will be examined. Since the state income payment series is an important tool in policy decisions regarding, e.g., federal contributions to state and local government activities, including the administration of federally sponsored welfare programs, an understanding of the sources of the observed differences among states is desirable. Too, the state income payment series provides a convenient yardstick for appraising the differences among states in wholesale trade earnings.

## KINDS-OF-BUSINESS

The *Census of Business, 1948* provides data for 244 kinds-of-business among the merchant wholesalers, manufacturers' sales branches with stocks, petroleum bulk stations and terminals, and the assemblers of farm products. The average annual earnings of the paid employees varied by kind-of-business from a low of $1,515 for employees of assemblers of fish and sea food to $6,892 for employees of piece goods converters (Table 1).[2] For the central two-thirds of the kinds-of-business the average annual earnings ranged from $2,900 to $4,200.

The wholesale trade establishments in a kind-of-business classification perform

* This report was developed as a part of the Study of Differences in State Per Capita Incomes, which is being financed jointly by Duke University and The Rockefeller Foundation.

[1] This study omits manufacturers' sales offices without stocks, and agents and brokers, which the Census includes in wholesale trade. Neither group is engaged to any appreciable degree in the physical handling of the goods they sell, nor do they normally maintain stocks. The two omitted groups reported 192,000 employees as of November 15, 1948.

[2] The average annual earnings by kind-of-business are computed by dividing the payroll for the entire year by the average number of paid employees. The average number of paid employees is obtained by summing the numbers reported for work weeks ended nearest the 15th of March, July, and November 1948, and dividing by 3.

TABLE 1

*Average Annual Earnings of Wholesale Trade Employees, United States, 1948*

| Average Annual Earnings | Kinds-of-Business (number) |
|---|---|
| Less than $2,300 | 8 |
| 2,300–2,499 | 8 |
| 2,500–2,699 | 8 |
| 2,700–2,899 | 10 |
| 2,900–3,099 | 20 |
| 3,100–3,299 | 30 |
| 3,300–3,499 | 32 |
| 3,500–3,699 | 29 |
| 3,700–3,899 | 28 |
| 3,900–4,099 | 14 |
| 4,100–4,299 | 15 |
| 4,300–4,499 | 10 |
| 4,500–4,699 | 7 |
| 4,700–4,899 | 5 |
| 4,900–5,099 | 10 |
| 5,100 and more | 10 |
| Total | 244 |

Source: *Census of Business, 1948*, Wholesale Trade, U. S. Summary, Table 1E. The above tabulation omits agents and brokers and manufacturers' sales offices without stocks.

similar functions and the amount of dispersion in the composition of skills or occupations required of their employees is limited. A state whose wholesale trade consisted chiefly of high average earnings kinds-of-business would be expected to have a higher state average earnings than a state whose wholesale trade consisted chiefly of low average earnings kinds-of-business. The kinds-of-business found in a state thus provides one explanation of why the average annual earnings of a state may differ from the national average or from the averages found in other states.

Two limitations to this kind of analysis need early attention. The first is that classification by kind-of-business limits but does not eliminate the dispersion in the composition of skills and occupations within the kind-of-business classification. Each establishment is likely to have its own unique composition of skills, and any classificatory device not based directly on skills will contain some dispersion within it. The extent of the approximation is determined partially by the number and characteristics of the kind-of-business categories employed. The 244 categories employed in the 1948 census of wholesale trade appear sufficiently numerous to eliminate much of the diversity among establishments. More categories would lead to a definition of a kind-of-business so narrow that only a handful of establishments in each category could be clearly classified. The remainder would be borderline cases fitting one about as well as another category.[3]

[3] Carried to an extreme there could be created enough categories to accommodate practically every establishment in some one narrowly defined kind-of-business. For most pur-

The second limitation relates to the approximate character of average annual earnings. The payroll figure reported by each establishment presumably is based on accounting records and is highly reliable. The number of employees, however, is based on only three payroll periods and is subject to a number of transient influences. Seasonal peaks, varying rates of turnover, varying lengths of work weeks, and many other similar influences can affect the differences in average annual earnings between establishments and between kinds-of-business.[4] Although the error thus induced is likely to be small, it is present nevertheless.

With these limitations of the kinds-of-business classifications in mind it is possible to use these classifications to isolate for each state that part of the observed differences in average annual earnings of wholesale trade employees that may be attributable to differences in the skills required by various kinds-of-business from that part which may be attributed to differences in pay for similar skills.

## STATE DIFFERENCES IN EARNINGS

By states, the gross differences between the reported average annual earnings and the average annual earnings of all wholesale trade employees in the United States, ranged from a high of 21.5 per cent above the national average in New York to a low of 26.8 per cent below the national average in Mississippi (Table 2). The average absolute percentage deviation from the national average is 10.8 per cent. The percentage deviations among the 36 states reporting smaller than national average earnings tend to be larger than those among the 13 states reporting greater than average earnings. The states having larger numbers of wholesale trade employees tend to pay their employees more than the national average. The New England, Middle Atlantic, East North Central, and Pacific divisions tend to pay more, while the remaining divisions tend to pay less than the national average.

A part of the total differences between the state and national averages is attributable to differences among the states in their composition of wholesale trade by kinds-of-business. By multiplying the average number of employees in a kind-of-business in a state by the national average annual earning for that particular kind-of-business, and then summing these products for all kinds-of-business

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poses such categories would be meaningless. Too, such a large number of categories would result in a high geographical concentration of the establishments in a particular category, and thus prevent a decision as to whether the observed differences in earnings were attributable to differences in the skills required or to geographical differences in pay for similar skills. A real test of the kinds-of-business classifications used would depend upon knowledge of the variance within each category. Such information is not available.

[4] Most of these difficulties could be overcome were man-hour data available so that average hourly, rather than average annual, earnings could be used, as they were for the manufacturing segment. See my, "Contribution of Manufacturing Wages to Regional Differences in Per Capita Income," *Review of Economics and Statistics*, 33 (Feb. 1951), 18–28. There is a question of whether wholesale trade establishments could report man-hour figures with sufficient accuracy for them to be as good as the employment figures reported.

TABLE 2

*Source of Differences in Earnings from Wholesale Trade, by State and Division, 1948*[1]

| State and Division | Average Number of Workers (thousands) | Total Annual Payroll ($ million) | | | Percentage Differences Attributable to: | | |
|---|---|---|---|---|---|---|---|
| | | | Computed on Basis of: | | | | |
| | | Reported | National average | State's kind-of-business | All sources | Kind-of-business | Earnings |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| New England | 128 | 431 | 429 | 436 | .5 | 1.7 | −1.2 |
| Maine | 10 | 27 | 32 | 31 | −17.4 | −5.1 | −13.0 |
| New Hampshire | 4 | 11 | 13 | 13 | −16.0 | −4.7 | −11.9 |
| Vermont | 3 | 9 | 10 | 10 | −12.1 | −4.2 | −8.2 |
| Massachusetts | 75 | 265 | 253 | 262 | 4.9 | 3.6 | 1.3 |
| Rhode Island | 11 | 34 | 36 | 37 | −5.2 | 3.6 | −8.5 |
| Connecticut | 25 | 85 | 84 | 84 | .6 | −.4 | 1.0 |
| Middle Atlantic | 535 | 2,026 | 1,793 | 1,943 | 13.0 | 8.4 | 4.2 |
| New York | 338 | 1,377 | 1,133 | 1,271 | 21.5 | 12.2 | 8.3 |
| New Jersey | 56 | 196 | 188 | 192 | 3.9 | 2.1 | 1.7 |
| Pennsylvania | 141 | 454 | 472 | 480 | −3.9 | 1.6 | −5.4 |
| East North Central | 432 | 1,522 | 1,449 | 1,448 | 5.0 | −.1 | 5.1 |
| Ohio | 111 | 384 | 371 | 374 | 3.5 | .8 | 2.6 |
| Indiana | 42 | 137 | 141 | 136 | −2.6 | −3.7 | 1.2 |
| Illinois | 164 | 597 | 549 | 556 | 8.8 | 1.3 | 7.4 |
| Michigan | 77 | 274 | 258 | 254 | 6.5 | −1.2 | 7.8 |
| Wisconsin | 39 | 129 | 131 | 128 | −1.3 | −2.3 | 1.0 |
| West North Central | 219 | 667 | 735 | 705 | −9.2 | −4.1 | −5.4 |
| Minnesota | 49 | 154 | 164 | 159 | −6.6 | −3.1 | −3.6 |
| Iowa | 32 | 94 | 108 | 98 | −13.2 | −9.3 | −4.2 |
| Missouri | 80 | 255 | 267 | 269 | −4.5 | .7 | −5.2 |
| North Dakota | 8 | 24 | 28 | 25 | −13.7 | −11.4 | −2.6 |
| South Dakota | 7 | 20 | 25 | 22 | −17.2 | −11.3 | −6.6 |
| Nebraska | 21 | 61 | 70 | 66 | −13.4 | −6.2 | −7.6 |
| Kansas | 22 | 59 | 72 | 66 | −18.4 | −8.6 | −10.8 |
| South Atlantic | 233 | 682 | 780 | 739 | −12.6 | −5.2 | −7.7 |
| Delaware | 5 | 17 | 16 | 17 | 7.3 | 8.1 | −.7 |
| Maryland | 31 | 93 | 103 | 100 | −10.1 | −2.9 | −7.4 |
| D. C. | 16 | 57 | 53 | 55 | 6.3 | 3.6 | 2.6 |
| Virginia | 33 | 92 | 111 | 100 | −17.2 | −10.5 | −7.6 |
| West Virginia | 17 | 53 | 56 | 55 | −4.1 | −1.8 | −2.3 |
| North Carolina | 34 | 96 | 116 | 109 | −16.7 | −5.5 | −11.9 |
| South Carolina | 13 | 35 | 43 | 41 | −18.2 | −4.9 | −14.0 |
| Georgia | 40 | 118 | 134 | 131 | −11.4 | −2.3 | −9.3 |
| Florida | 44 | 120 | 148 | 131 | −19.1 | −11.4 | −8.6 |
| East South Central | 97 | 275 | 326 | 319 | −15.6 | −2.1 | −13.7 |
| Kentucky | 23 | 68 | 78 | 76 | −13.3 | −3.0 | −10.6 |
| Tennessee | 36 | 108 | 122 | 123 | −11.6 | .5 | −12.0 |
| Alabama | 25 | 69 | 83 | 81 | −17.7 | −3.2 | −14.9 |
| Mississippi | 13 | 31 | 43 | 40 | −26.8 | −5.8 | −22.3 |
| West South Central | 178 | 517 | 596 | 576 | −13.3 | −3.4 | −10.3 |
| Arkansas | 13 | 35 | 45 | 42 | −22.4 | −7.0 | −16.6 |
| Louisiana | 34 | 98 | 112 | 112 | −12.9 | −.8 | −12.1 |
| Oklahoma | 23 | 70 | 79 | 76 | −11.4 | −3.5 | −8.2 |
| Texas | 107 | 314 | 360 | 347 | −12.7 | −3.6 | −9.4 |

TABLE 2—*Continued*

| State and Division | Average Number of Workers (thousands) | Total Annual Payroll ($ million) | | | Percentage Differences Attributable to: | | |
|---|---|---|---|---|---|---|---|
| | | | Computed on Basis of: | | | | |
| | | Reported | National average | State's kind-of-business | All sources | Kind-of-business | Earnings |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mountain | 64 | 192 | 216 | 204 | −10.9 | −5.4 | −5.9 |
| Montana | 7 | 21 | 23 | 22 | −10.6 | −6.4 | −4.5 |
| Idaho | 7 | 19 | 23 | 19 | −18.0 | −19.2 | 1.5 |
| Wyoming | 2 | 6 | 7 | 6 | −12.2 | −5.9 | −6.7 |
| Colorado | 23 | 70 | 79 | 77 | −11.3 | −2.6 | −8.9 |
| New Mexico | 4 | 12 | 15 | 14 | −16.5 | −3.4 | −13.5 |
| Arizona | 8 | 23 | 26 | 24 | −8.9 | −8.4 | −.6 |
| Utah | 11 | 36 | 38 | 38 | −6.9 | −.8 | −6.2 |
| Nevada | 1 | 5 | 4 | 4 | 4.8 | −3.5 | 8.7 |
| Pacific | 267 | 909 | 896 | 853 | 1.4 | −4.8 | 6.5 |
| Washington | 41 | 138 | 137 | 130 | .8 | −4.7 | 5.8 |
| Oregon | 26 | 90 | 88 | 84 | 2.6 | −4.4 | 7.3 |
| California | 200 | 681 | 671 | 639 | 1.4 | −4.8 | 6.5 |

[1] Because of rounding, the figures may not add to the totals. The percentages were computed before rounding.

Cols. 1, 2, and 3: from *Census of Wholesale Trade, 1948.*

Col. 4: The number of workers for a state, column 2, multiplied by the average annual earnings of all wholesale trade employees. The average annual earnings were computed by dividing the U. S. total wages paid wholesale trade employees in 1948 by the average number of workers for the U. S. as shown in the *Census of Wholesale Trade, 1948.*

Col. 5: The average number of workers reported for a particular kind-of-business multiplied by the United States average annual earnings for that kind-of-business, and the products summed for all kinds-of-business in that state. The basic computations were made at the detailed kind-of-business level; see text, footnote 6.

Col. 6: (Col. 3 − Col. 4) divided by (Col. 4), expressed as a percentage. A minus sign (−) indicates that column 4 is larger than column 3, or that average annual earnings of wholesale trade employees in the state are less than the national average.

Col. 7: (Col. 5 − Col. 4) divided by (Col. 4), expressed as a percentage. A minus sign (−) indicates that the state's kind-of-business composition is unfavorable.

Col. 8: (Col. 3 − Col. 5) divided by (Col. 5), expressed as a percentage. A minus sign (−) indicates that the state's wholesale trade earnings, on the average, are below the national average for the state's kinds-of-business.

found in the state, the payroll which the state would have had if differences in the kinds-of-business were the only variable can be computed (Table 2, column 5).[5] By comparing this computed payroll with the payroll that would have resulted if all wholesale trade employees in the state were compensated at the national average, the differences among states attributable to differences in

[5] Since it was not possible for the Bureau of the Census to publish data by detailed kind-of-business for every state, the actual computations of this column were made by the Bureau of the Census as a special tabulation. While all 244 kinds-of-business were used in making these computations, the results were made available only in the form of group totals which can be published without disclosing data concerning individual establishments.

kind-of-business composition can be measured. The percentages shown in Table 2, column 7, indicate the extent to which each state's kind-of-business composition deviates from the national average composition. The most favorable kind-of-business composition is found in New York (12.2 per cent above the national average); the most unfavorable composition is in Idaho (19.2 per cent below the national average). Of the 11 states with favorable composition, 7 are along the eastern seaboard. Missouri is the only state west of the Mississippi with a favorable composition. The average absolute percentage deviation attributable to composition is 4.9 per cent, less than one half of the average absolute percentage deviation between the reported payrolls and those computed from the national average annual earnings.[6]

Since the payrolls shown in column 5 take into account a state's kind-of-business composition, a comparison of this column with the reported payrolls in column 3, will provide a measure of differences in the compensation for similar kinds of work (column 8).[7] Nevada which pays 8.7 per cent more than the average based on kind-of-business composition, is closely followed by New York which pays 8.3 per cent higher compensation. At the other end of the scale, Mississippi pays 22.3 per cent less than average for the kinds-of-business found there. The average absolute percentage difference is 7.4 per cent, somewhat higher than the similar average for composition. Of the 15 states paying more than average compensation for their kinds-of-business, 10 are located in the Middle Atlantic, East North Central, and Pacific divisions.[8]

[6] Some insight as to the source of the differences in kind-of-business composition can be obtained by carrying out a similar analysis for each of the major kind-of-business groups. This has been done for the 15 groups having more than two kinds-of-business using the 9 Census divisions as the basis of a geographic distribution. This provides a table showing the percentage differences for each of the 9 geographic divisions in the kind-of-business composition *within* each of 15 kind-of-business groups. In this table the United States composition for the kind-of-business group, rather than for all wholesale trade, is used as the base. By ranking the percentage differences for a group from the largest negative difference to the largest positive difference it is possible to test whether the within group differences are associated with geographic division. M. Friedman, "The Use of Ranks to Avoid the Assumption of Normality Implicit in the Analysis of Variance," *Journal of the American Statistical Association* XXXII, 675 (1937). Such a test indicates that differences at the divisional geographic level within the major kind-of-business groups contribute significantly to the state differences from the United States kind-of-business composition. The observed differences in composition, thus, are not entirely the product of differences in the geographic distribution of the major groups; these between-group differences are supplemented and reinforced by differences within the groups by detailed kinds-of-business.

[7] The 'standardized payrolls' shown in column 5 seem to be the appropriate base for computing the percentage differences. Since the United States average figures (column 4) have been used as the base for the gross percentage differences (column 6) and the percentage differences attributable to kinds-of-business (column 7), columns 7 and 8 may not add to column 6.

[8] When the differences between the reported payrolls and those computed from the kind-of-business composition for each of the 9 geographic divisions are examined the differences are found to persist for each major kind-of-business group. The sign of the differ-

The kinds-of business composition accounts for approximately 50 per cent of the gross differences among states in observed annual wholesale trade earnings in 1948.[9] The remaining 50 per cent of the gross differences (shown by state in column 8, Table 2) is attributable to the variety of forces which give rise to dispersion in average earnings within a single kind of business. Differential compensation for similar work could give rise to such within kind-of-business dispersion, as could differences among firms in the same kind-of-business in the occupational composition of their employees, differences associated with size of firm, and differences in the range of activities of firms within a single kind-of-business classification. The concordance of the signs in columns 7 and 8, Table 2, is sufficient to show that there is a tendency for the states with the less favorable kinds-of-business composition to also be the ones in which employee earnings are below average for the observed kinds-of-business composition.

The small number employed in wholesale trade does not seem to justify the attempt to carry these computations back to earlier years at a detailed level.[10] Something of the changes over time may be learned from an examination of the gross differences in average annual earnings among the states and the United States. The average absolute percentage difference for 1948 is 10.8 per cent (Table 2, column 6). Similar averages for 1933 and 1935 were 12.2 per cent, and for 1939, 15.6 per cent. In 28 of the 48 states the absolute percentage difference was smaller in 1948 than in 1933. The differences shown in Table 2, therefore, tend to be at a minimum for the years for which business census data are available.

## INCOME EFFECTS

The state differences in wholesale trade earnings, whether attributable to differences in kind-of-business composition or in pay scales, have a negligible effect on the observed differences in state per capita incomes. The extent to which variations in wholesale trade earnings contribute to state per capita income differences can be measured by dividing, by the state's population, the

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ence in each of the 20 major kind-of-business groups was the same as the sign for the geographic division as a whole in four divisions, was the same in 19 out of the 20 groups in three more divisions, was the same in 16 out of the 20 groups in the Pacific division, and was the same in 13 out of the 20 groups in the New England division. A test of the division ranks, similar to that mentioned in footnote 6, above, shows that the differences are highly associated with geographic division.

[9] This measurement is based on the coefficient of determination ($r^2 = .50$) between the average annual earnings of wholesale trade employees as reported in the Census (column 3 divided by column 2, Table 2) and standardized for kinds-of-business (column 5 divided by column 2). Of the 50 per cent of the observed variation accounted for by variations in kinds-of-business, 28 per cent is direct effects, and 22 per cent is attributable to the regression of observed and standardized earnings. Using the same methods approximately 54 per cent of the observed state differences in the 1947 manufacturing production worker hourly earnings is explained by industry-mix.

[10] It would be necessary to rely exclusively on the published data, and the fact that some information had to be withheld to avoid disclosing the operations of individual firms, would introduce some error.

difference between reported earnings and earnings computed on the assumption that the wholesale trade employees in each state had the same average earnings, and adding algebraically this per capita difference to the state's per capita incomes.

The small size of the adjustments in state per capita incomes found in this way is due almost wholly to the relatively small proportion of the labor force engaged in wholesale trade. The wholesale trade employees treated here are only 1/30th of the civilian labor force. The compensation paid them was about 1/18th of total wages and salaries payments for 1948.[11] The largest single adjustment is in New York, where 1948 per capita income would be reduced by $17 had the wholesale trade employees there been compensated at the United States average annual earnings figure. The largest increase in per capita income on the same basis, $11, would have occurred in Florida. In three-fourths of the states this type of adjustment would increase per capita incomes. Although small, this type of adjustment would reduce the range of 1948 state per capita incomes by only 2 per cent; the lowest income in Mississippi of $744 would be increased to $750, while the highest income in New York would be reduced from $1,810 to $1,793.

Since the states having the lower per capita incomes tend to be the states which have the larger negative percentage differences, i.e., have the more unfavorable kind-of-business compositions and the lower average annual earnings,[12] the adjustments are in the direction of explaining state differences in per capita incomes.

## CONCLUSIONS

For one year the data compiled in the *Census of Business, 1948* provide an opportunity to examine in some detail the sources of the observed differences in the average annual earnings of wholesale trade employees. The 244 kinds-of-business classifications appear sufficient to classify wholesale trade establishments into relatively homogeneous groups with respect to the skills or occupations required of employees, and thus provide an acceptable standard for distinguishing among states with respect to these employee characteristics. The portion of the observed differences in average annual earnings among states which cannot be accounted for by kind-of-business composition can be attributed to differences in compensation for basically similar skills. Using these tools of analysis, the findings may now be summarized.

1. The kinds-of-business composition in most of the states is unfavorable. Of the 11 states having favorable compositions, 7 are on the eastern seaboard, and all but one are east of the Mississippi river. Differences in kind-of-business

[11] Robert E. Graham, Jr., "State Income Payments in 1951," *Survey of Current Business*, August 1952.

[12] The coefficient of rank correlation between 1929–50 average per capita incomes (ranked from lowest) and the percentage differences attributable to kind-of-business (Table 2), ranked from largest negative to largest positive is .46. The corresponding coefficient for incomes and the percentage differences attributable to earnings is .77.

composition account for approximately 50 per cent of the gross differences among states in average annual earnings.

2. The remaining 50 per cent of the gross differences among states in average annual earnings is traceable to differences in compensation for similar types of work. These differences tend to persist throughout all the kinds-of-business found in a geographic division.

3. The direct effect of these differences on the differences in state per capita incomes is in the direction of reducing interstate dispersion, though negligible in magnitude. Were all wholesale trade employees compensated at the national average of $3,357 per annum, the largest adjustment to per capita income in any one state would occur in New York and reduce per capita income by only $17. On the other hand, Florida income would be increased by $11. The small size of these adjustments follow from the relatively small numbers of persons engaged in wholesale trade.

4. There is a tendency for the states with lower per capita incomes to have the less favorable kinds-of-business composition and to compensate the employees in a given kind-of-business category at lower than average rates.

# TRADE UNIONISM AND CENTRAL PLANNING IN WESTERN EUROPE

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## PRACTICAL SOCIALISM AND PLANNING

"Twenty years ago there was little talk of central planning. Socialism entails, it was then held; (1) the extrusion of private profit-making, in the sense of one man or group hiring other men and selling their output for profit to a third party; and (2) the public or collective ownership of the means of production (other than human beings). Neither of these requirements singly make necessary any form of central planning. The Collective or public ownership of instruments of production is equally feasible without any associated central planning."[1]

It was not only because they believed in the feasibility of socialism without any associated central planning that trade unionists eschewed the idea of central planning. Sidney Webb's proposals for the establishment of a Supreme Economic Planning Board to draw up production plans evoked little interest outside his Fabian circle, simply because his central-planning scheme was ideologically unacceptable to unions. Though he provided for democratic safeguards and reserved for unions a key role "as a permanent part of social organization, destined in the State of To-morrow for important functions,"[2] he could not overcome their guild-socialist scruples against centralized control.

French unions, ideologically committed to anarcho-syndicalism which stood for de-centralization and the small producers' community, were unalterably opposed to an *économie dirigée*, *dirigisme* being identified with centralism and state intervention in general. The demand for socialization of credit, mining, transport, and power, after the First World War, was prompted by ideological objections of unions to the centralizing *dirigiste* forces in business and politics of the Third Republic. Even in Germany, where socialist-controlled trade unions acquiesced in the acceptance of centralization and concentration as an inevitable development to some "higher" form of economic organization, comprehensive planning schemes, such as the abortive Rathenau plan, were ignored by the movement.

Seen in retrospect, the trade union position seems paradoxical. Control over this largest organized group in an industrial society constitutes a formidable force in shaping national policy. Its leadership was inclined to deal with changing situations in a pragmatic fashion, relying upon *ad hoc* decisions which were often at variance with its assumed socialist ideology. It stressed the dual character of the movement (immediate improvements and a socialist Utopia), yet had to confine itself to the "realistic" demands of social reform. It accepted, through its affiliated political parties, joint governmental responsibilities with other

[1] A. C. Pigou, *Socialism versus Capitalism* (London, 1949), p. 6.

[2] Introduction to *Fabian Essays* (London, 1920).

interest groups, though it could not possibly transcend the narrow sectional interests of its membership.

Aware of the fact that a simplified underconsumptionist approach had an effective mass appeal, trade unionists would use "surplus" and "exploitation" arguments to stress the injustice in the distribution of national income. In spite of Marxist terminology, but contrary to Marxist assumptions of the inadequacy and eventual failure of capitalist production, these arguments were in line with J. S. Mill's deterministic view of the "laws of production of wealth" as "physical truths." "Distribution of wealth," on the other hand, was considered "a matter of human institution only."[3] Except for orthodox socialists in the movement, trade unionists believed that levelling in the disparities of income distribution was possible without altering the productive system. In contrast to orthodox socialism, "practical socialism" would "proceed experimentally, guided by the light of experience rather than by any elaborate, preconceived theory."[4]

To rectify the distributive system, unions would embark upon an elaborate program with small-scale planning on a communal basis, confined primarily to consumption needs of labor. The slogan "out of the bargaining union must grow the producing guild,"[5] implies a guild-socialist concept of producing units, supplementing, though not supplanting, the existing productive system.

Practical socialism, often considered as an antidote to central planning, had no mitigating effect upon centripetal trends such as concentration and integration. Trade unionists looked upon rationalization (as a result of concentration) without corresponding market expansion to absorb its excess capacity as an insidious form of exploitation, since it tends to freeze a reserve army with disastrous effects upon wage bargaining. Hilferding's analysis explained these cartellizing trends "replacing free competition by the social principle of planning production" as part of an inevitable historical development. Though it affected adversely labor's short-run interests, this phase is but a transient one. In a pluralistic political system, trade unionism could assume political power to safeguard the achievements of practical socialism. Granted a parliamentary majority, a trade-union affiliated party would perform administrative tasks, yielded by the old bureaucracy. Trade unions would thus function as legitimized agencies for determining national policies, and "invoke state aid in translating this economy, *organized* and *directed* by the capitalists, into an economy directed by the democratic state."[6] The latter would coordinate planning activities, and thus counteract the effects of rationalization upon wages and employment.

Though Hilferding's analysis applied to the cartellized German economy, his concept of "organized capitalism" is basically similar to the "controlled" or "planned capitalism," advocated by British and Scandinavian labor since depression days. Both concepts are pluralist and gradualist in their approach;

[3] J. S. Mill, *Principles of Political Economy* (ed. Ashley, 1923), pp. 199–200.
[4] Hugh Dalton, *Practical Socialism for England* (London, 1935), p. 300.
[5] G. D. H. Cole, *Self-government in Industry* (London, 1928), p. 42.
[6] Franz Neumann, *Behemoth* (New York, 1944), p. 15.

both rely upon parliamentary majorities to set up a "central machinery" for control of the "planning mechanism."[7]

The customary answer to the question: Why socialization? was, that since business enterprise, particularly in industries with a strong monopolistic element, tends to maximize profits at the expense of the labor factor, public ownership would simply correct the system of distribution by equating the reward of labor to its contribution. This line of argument for socialization becomes tenuous, if, under "planned" or "organized" capitalism, those in control of various enterprises can be induced to equate the rewards of factors to the value of their marginal products rather than to maximize profits. If a Central Planning Authority decides upon nationalization of a particular industry in order to break restrictive practices or to raise standards of management, it would not necessarily involve a transfer of ownership. Private ownership could still draw profits, provided that the price paid to the labor factor is determined by an agreement reached between unions and some Central Planning Boards.

The planning mechanism, confined to the production level, would then determine how much to produce, what prices to charge, and incidentally, remove the threat of cyclical fluctuations which were ascribed to the vagaries of the market.

### ACCUMULATION, WAGES, AND PLANNING

"When, as in our countries (England and Scandinavian countries) the fiscal and social policies come within sight of their economic limits, when taxes are absorbing the major part of the incomes of the rich and becoming very burdensome far down in the working classes, and when the envisaged social reforms are nevertheless by far not completed, then the will towards social improvement turns to control of production."[8]

This is implicit in all labor platforms, including the 1953 manifesto *Challenge to Britain*. In *Let's Face the Future* (1945), it was proposed that a Labor government go beyond the task of reconstruction and re-equipment, and initiate a program of state-induced and state-controlled expansion of capital and export-goods production to help pay the cost of expanded social services. Implementation, however, of such an ambitious program involves a complete departure from the guild-socialist-syndicalist inspired approach with its preference for local controls and for co-operative small-scale planning efforts on a communal basis.

It should not be forgotten that, though opposed to target planning in particular, trade unions, mainly under the impact of reconstruction requirements, endorsed a program which requires targets and compulsory direction far beyond the scope of a post-war emergency. Though experienced in the art of compromise, trade union leadership, when saddled with governmental responsibility, found it

[7] Dalton, *op. cit.*, p. 250.

[8] Gunnar Myrdal, "The Trend Toward Economic Planning," *The Manchester School of Economic and Social Studies*, December, 1949, p. 20.

increasingly difficult to bridge the gap between ideological divergencies and diverse sectional interests. It found itself in an unenviable position, where it accepted the responsibility for carrying out planning commitments which call for compulsory direction, and yet appeared to vacillate and fail at its implementation. Trade unionism's apparent contradictory position with its divisive tendencies may be summarized as follows:

(1) Implementation of central planning decisions, involving target planning[9] within the framework of Western economies, inevitably leads to serious frictions. Could a labor government in England, for example,—with four-fifths of its industries in private hands—enforce compliance with definite targets by the private sector? Would compulsory direction have the necessary effect? Since it is ideologically opposed to compulsory direction, as it is to centralized wage determination, a trade-union supported government has no choice but to call for voluntary response "of both sides of the industry" to accept the objectives of government planning.[10]

Its attempts at implementation—under the trying conditions of post-war shortages and pressing reconstruction needs—resulted in "a lopsided economy" where "this lopsidedness costs us dearly in shortages of essential commodities," according to socialist critics of their own government, because it was reluctant to resort to compulsory direction. For "where there are shortages the only 'planning' that is to be done is to ration demand."[11] The task of allocating man-power and raw materials between private and public sectors, domestic and export industries, capital and consumption goods, etc. would have been less formidable with direct restraints upon consumption (as during the war). Target planning becomes unenforceable, if consumption and the private sector in general have to be subordinated to target objectives, with only half-hearted response from "both sides of the industry" to government exhortations. "Having found that targets cannot be hit simply by exhortations the government ceased to set targets."[12]

(2) Even a modest program of post-war reconstruction and modernization, concentrating upon selective investments to permit desirable projects for improvement of national capital assets, requires increased controls over capital formation and capital direction. It is true of practically every Western European country—no matter of what political complexion its government happens to be—that "the State has (now) claimed the right and assumed the duty of making and implementing on behalf of the community one of the most fundamental of economic choices, namely the distribution of productive resources between

[9] Target planning, according to Sir Hubert Henderson, consists "in the formulation of precise quantitative programmes extending over a considerable range of time ahead." D. H. Robertson, *Utility and All That* (New York, 1952), p. 48.

[10] See *Economic Survey of 1947* where the Labor government conceded "that the task of directing by democratic methods an economic system as large and complex as our is far beyond the power of any government machine working by itself no matter how efficient it may be."

[11] W. A. Lewis, *The Principles of Economic Planning* (London, 1949), p. 113.

[12] *Ibid.*

present and future uses. In other words, it has taken upon itself the responsibility for determining the rate of growth of the community's real capital."[13]

If expansion of social services requires still further substantial additions to the national product, hence an increased rate of investment and productivity, one should expect full trade-union support for such controls. Yet its leaders remain sharply divided as to scope and extent of capital and productivity controls. The followers of Webb (within the movement) would use controls as an opening wedge toward socialization of investment, or, at least, for the time being, nationalization of all new investments. Government control over the net rate of investment could eventually lead to socialization of all investments. Compulsory direction of capital into planned projects would have the effect of equating *ex ante* savings with investments, while eliminating competitive projects. It would tend to disallow private savings and, in the end, rely, as in Russia, mainly upon compulsory savings. That trade-union leadership would reject such controls, is quite clear.

But if its program demands control of investments, could the traditional type of financial and fiscal management be relied upon to stimulate investments and check others by manipulation of interest rates (imposing higher rates upon less desirable projects) or discriminatory tax rates (imposing higher tax rates upon material used for such projects)? Administrative interference of this kind, while resented by the business and banking community, may prove ineffective in channeling capital to desired projects. The same holds true of curtailment of capital export (reversing a long-established practice of London or Paris capital markets), should short-run domestic considerations demand it, that is, as long as investments at home exceed voluntary savings.

(3) Increase in productivity is another vexing problem to trade unions. While old-line craft unions fear the effects of labor saving devices and standardization on the future of their craft, practically all trade unions see in it the specter of excess capacity and unemployment. It was assumed that joint union-management consultation or co-determination, seemingly an effective substitute for socialization, would greatly contribute to the raising of workers' morale and effort, and result in a rapid increase in productivity. It has become clear now, that trade-union leaders could not resist the demand of workers that returns from added output go into wages rather than into a capital fund. Appeals to

[13] Robertson, *op. cit.*, p. 116. It should be added that target planning, similar in scope to the Russian time-limit type of state planning, has the alarming implication of compulsory direction extended into all economic activities. Foreign capital called upon to provide some of the necessary funds for large-scale projects would be more than hesitant to make itself available for such purposes. Reporting from Oslo (*New York Times*, July 15, 1954), Arthur Krock has this to say about Norway's attraction to foreign capital: "The [Labor] government's task will be to persuade foreign capital that it can export fair profits and need not fear expropriation or any form of nationalization. The present regime already gives these assurances, which should impress investors because the Norwegian word is traditionally good. And if the Conservatives took over, their political philosophy is such that the assurances would be automatic."

"responsibility" for "joint" conduct of business are bound to fail if increased productivity depends on greater effort during a wage freeze[14] or on devices which may, in the end, spell replacement of men by machines.

What inducements toward greater effort, except wage incentives, can unions offer? Exhortations are of no avail, unless a war occurs when emotional appeal finds ready response, or a social revolution which brings with it the mass appeal of class antagonism. Is it possible to convince workers that the survival of their country (say, England or Germany) depends upon its balance of payments? The obvious function of unions is "to secure the best terms they can for their members and to prevent employers from taking advantage of their monopsonistic position vis-à-vis the workers."[15] It is equally clear that union leaders, who feel at home at the bargaining table, would readily use consultations (affecting efficiency in production) as an opening wedge for wage-bargaining. For the same reasons did the British Labor government fail in its feeble attempts at compulsory direction of labor into desired projects. Exhortations had the same effect.

(4) Less concerned about deficiencies in post-war supplies than about return of "normal" pre-war conditions, when insufficient demand left a sizable part of the labor force unemployed, trade unionists pose the question, often reiterated during depression years: Why was it that in the war we were able to find employment for everyone? The answer (in Clement Attlee's own words) was "that the government controlled the purchasing power of the nation." If "it was found necessary during the war for the government to take hold of purchasing power . . . and deliberately to say that certain things were essential because we were at war," shouldn't the government assume this responsibility in peace time?

Preoccupied with employment and wages, they would assign to the government the basic function of drawing up plans, partly as forecasts for the future, based on projected trends of production, partly as a budgetary measure to fill an anticipated gap in the aggregate demand. One is tempted to simplify matters somewhat by assuming that trade union aspirations—modest as they are—would be satisfied if only some equivalent of Say's Law could be devised and legislated into an act providing that demand *must* equal supply; that savings *must* equal investments; and that both, investments and consumption, increase at an equal pace!

[14] The onerous wage freeze "served to freeze the maldistribution of labor." "To the degree it was successful, the wage freeze not only froze the maldistribution of labor but also, ironically, resulted in labor exploitation similar to that attributable to monopsony in the labor market." (Sidney E. Rolfe, "Manpower Allocation under British Planning, 1945–49" *American Economic Review*, June, 1954, p. 364; *note* p. 366.) German trade unions accepted a wage freeze in 1948 in a triangular agreement involving the government and industry to permit speedy reconstruction and to give Germany a cost advantage to recoup its foreign markets. In terms of real wages the position of the German worker steadily deteriorated until 1954.

France has the complicated system of wage determination, where wages in the nationalized sector, in spite of union participation on managing boards, are usually set by government officials who, mindful of the sorry state of the treasury, are reluctant to grant increases. The private sector, as a rule, follows the government.

[15] Joan Robinson, *Essays in the Theory of Employment* (Oxford, 1947), p. 2.

(5) Having a parliamentary majority, a trade-union supported government could resort to a number of expedients to secure increases in real wages, while setting up a central machinery to "direct" expansion of capital goods production and social services. It could impose a permanent system of price control, redistributive taxation (which, as Myrdal points out, may have reached a point of diminishing returns), or, if need be, adopt a purportedly Keynesian approach of deficit financing, an approach which seems to appeal particularly to many influential trade unionists in England and Germany.

Reliance upon methods of financing planned projects (for full employment) and wage increases with highly inflationary implications, has been condemned with equal vehemence by conservative and socialist economists. Full-employment planning relying upon budget deficits, though regularizing union membership and placing unions into a better bargaining position, would lead to "a breakdown of the standard of value," and "in the case of a country dependent on imported raw materials" (that is, practically all Western European countries) cause "a dearth of material on which to set men to work."[16]

If "some at least of the enthusiasts for planned hyper-employment" are "as ready as any classical economists to lecture trade unions on the virtue of moderation in the matter of wages,"[17] they are chiefly concerned about the political responsibility of trade unionism. Precisely because it shares this responsibility, it can ill-afford the use of "power-bargaining" (to borrow Professor Selekman's apt term), a technique applied by powerful unions in the United States under tough leadership, and without definite political or ideological commitments.

The paramount issue faced by trade unionism in Western Europe is: How can investment and export needs for future development be reconciled with workers' demands for a greater share of the national product? Can the admittedly high corporate profits be channeled into desired investments without an "investment strike" on the part of the private sector? Should militant groups within the movement be given free rein—after assumption of power—to expand state control of production and planning? In which case "the rule of 'laborism' would begin transcending the framework of a capitalist society and enter the road to all-out socialization."[18] Or should unions accept the advice of economists on wage-restraints, budget savings, "living within means," "economic necessity," etc.? Either course would threaten the very existence of the type of unionism exemplified by the British movement.

(6) There remains the expedient of price control, the extent and effectiveness of which depends upon the political strength of trade unions. Where price control may have contributed to a balanced income relationship between agricultural interests and industrial workers—in Germany and France—it was not tried, simply because trade unionism is split in the latter, weak in the former, and politically unable to give effective support to sectional demands.

[16] Robertson, *op. cit.*, pp. 91, 92.

[17] *Ibid.*

[18] Paul A. Baran, "National Economic Planning," *A Survey of Contemporary Economics* (Homewood, Ill., 1952), vol. 2, p. 376.

In both countries, agricultural interests have retained their highly advantageous political position, augmenting their real income at the expense of non-agricultural sections under the protective arm of the government. In the half-planned French economy "without price control, but with wage control,"[19] it is only natural that real wages should remain low, though the rate of production has steadily increased in recent years.

## CONCLUSION

The compromise reached at the Margate conference in the fall of 1953 between the two factions of the British Labor party evoked favorable comments in the British press. The "Victory of the Moderates" was depicted by David Low, the famous satirist, in a devastating cartoon under the caption "Retreat to Liberalism." It showed labor leaders in the tattered uniforms of Napoleon's guard, perched on old nags and carrying battered standards with inscriptions: "Nationalization Postponed Indefinitely," "Non-Planning." Some people would be inclined to add, that unlike Napoleon's campaign, this retreat came after a friendly visit to Moscow, though it is doubtful that Low meant it that way.

Actually Margate (as every Labor conference since the War) revealed an ideological rift between two factions rather than a retreat from a position agreed upon by the party as a whole. In fact, the program adopted is anything but "liberal" in the old-fashioned sense. It included not only proposals, more or less mandatory, for the next Labor government to re-nationalize steel and road transport, but also to expand nationalization (chemicals, machine tools, the aircraft industry, water), social security benefits, free health services, free education, etc. It even demanded that a tax be put on capital.

Reflecting the dissatisfaction of Sidney Webb's disciples with the compromise, *The New Statesman* (October 10, 1953) took the trade-union leadership to task for emphasizing (as it did in 1945) expansion of social services, while refusing "to accept the *advance* to socialist planned economy, without which the enlarged Welfare State must inevitably founder." Powerful trade unionists, however, unionists who represent long-established craft unions, and belong to the stronger faction in the dispute, share with liberal tories and reform-liberals an ideological kinship in their reluctance to accept the state as a coërcive arm of a Planning Authority. They are anxious to assert their independence, lest they be placed in the ambivalent position—as members of a cabinet, for example—of approving as responsible cabinet officers, what they would reject as union leaders, such as wage restraints or control over mobility of labor.

British trade-union decisions are of pivotal importance as far as socialist-dominated trade unions in Western Europe go. Britain still retains, in spite of ideological divergencies, a single, united labor movement, while on the continent (with the exception of Scandinavian countries) labor is sharply divided along religious and political lines. Preoccupied with bargaining over comparatively low wages and struggles over rival unionism, unions on the continent look upon the

[19] Adolf Sturmthal, "Nationalization and Workers' Control in Britain and France," *The Journal of Political Economy*, February, 1953, p. 66.

British organization as a model of solidarity and effectiveness, a model to be emulated.

The question remains, however: To what extent is trade unionism prepared to accept responsibility for economic planning? While the dominant factions in France and Italy are Marxist-oriented, hence indifferent to planning in mixed economies, the German movement, momentarily at least, has adopted a business-union approach, leaving all matters pertaining to planning to the initiative of the government and industry. British and Scandinavian leadership, on the other hand, faces the dilemma of being forced to accept the responsibility for planning, and reconciling it with its scruples against compulsory direction, its consumptionist bias (a common characteristic of all trade unions) against compulsory savings, its preference for *ad hoc* decisions and, above all, for "practical socialism."[20]

Sharing with the economic liberal his concern over the possible failure of planning as a substitute for the market mechanism, lest some irremediable error, in the absence of automatic checks on profits and loss, may result in a disaster, fearing (as economic liberals do) the revolutionary consequences of central planning (particularly target planning), many trade unionists would, perhaps, be inclined to begin the "retreat to liberalism," specifically toward the kind of business unionism prevalent in the United States and in Germany now. But, though politically powerful, they are ideologically under constant pressure from pro-planning groups within trade unions. The compromise reached at Margate is an indication of the strength of these groups. It reveals trade unionism's contradictory position which, after all, is the nature of compromise between conflicting ideologies.

[20] The similarity between "practical socialism" and the New Deal is obvious. When faced with a depression, both relied upon *ad hoc* proposals for improvisations to meet (it was assumed) passing emergencies. Trade-union planning proposals (French labor's *plan du travail*, British labor proposals, etc.) to cope with unemployment through public works proved ineffective, since they lacked the powerful backing of a combination of diverse forces and sectional political pressures which made large-scale planning under the New Deal Administration possible. The difference in planning approach between the "practical" socialist and the practical reformer of the New Deal lies in the fact that the former presented his planning proposals in terms of *à prori* principles, while the latter rejected an ideological approach.

An episode related by Eric F. Goldman (in his book, *Rendez-Vous With Destiny*, New York, 1953) perhaps best illustrates this "pragmatic" approach. When Senator Norris asked President Roosevelt how he would interpret "the political philosophy behind T. V. A.," Mr. Roosevelt answered: "I'll tell them it's neither fish nor fowl, but, whatever it is, it will taste awfully good to the people of the Tennessee Valley."

# SOME IMPLICATIONS OF PRIVATE PENSION FUNDS*

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I

Wartime wage controls, excess profit taxation and union pressure have encouraged a marked expansion in private pension programs during the past decade. Reserves for these programs are now estimated to be between seventeen and twenty billion dollars and may well approach forty billion dollars by 1960.[1] Unless adequate adjustments are made in the social security program, an ultimate figure of seventy-five billion dollars is entirely conceivable.

In view of the potential magnitude of these reserves it is interesting to examine certain theoretical implications of private pension programs. Attention is directed first to the essential differences between public and private pension programs. An attempt is then made to show that the federal government may feel impelled to finance indirectly the growth of private pension funds. Consideration is given finally to the influence of this new investment channel upon the capital market.

The time horizon of this study does not extend beyond the interval during which private pension funds will continue to increase. It is therefore presupposed, unless otherwise specified, that cash inflows exceed benefits paid out under private plans. Given no major changes in the economy, the growth period is likely to persist for two decades or more.

The prospect for continued increments to private pension reserves rests upon the relative newness of most private pension programs and upon the tendency toward extended coverage. The youthfulness of existing plans is evidenced by the fact that, although 9.6 million persons were covered in 1951, less than half a million were receiving benefits. The Bureau of Internal Revenue has, moreover, retarded the funding of recently adopted pension plans by denying the full tax offset for annual deposits which exceed ten per cent of past service liabilities.

Simple extrapolation points to extension in coverage. In 1940 there were 1,965 private pension plans, covering 3.7 million persons; whereas by 1951, the plans numbered 14,000 and covered 9.6 million persons.[2] The National Planning Association assumes that approximately half the labor force will be covered by some type of private plan within twenty-five years.

The underlying stimuli which have encouraged the expansion in coverage still exist in large part. The corporation income tax remains high, despite the removal

* The author acknowledges the helpful assistance of Ed Mansfield of Duke University.

[1] National Planning Association, *Pensions in the United States, A Study Prepared for the Joint Committee on the Economic Report* (1952), p. 50. These estimates assume 1951 prices. Private pension programs include both trusteed and insured plans, but the estimate of twelve billion dollars excludes reserves held by the 3,000 deferred profit-sharing plans.

[2] National Planning Association, *op. cit.*, p. 11.

of the excess profits tax. Unions continue to exert pressure for additional fringe benefits. Congress appears to be hesitant in raising Social Security benefits substantially.

Additional considerations influencing the growth of private pension reserves include the degree of inflation and the nature of funding. Eighteen per cent of the plans adopted during the period 1950–1952 base benefits upon an average of wages for the final years of service, while another ten per cent employ this base in determining certain benefits.[3] Slightly over fifteen per cent of seventy-one plans adopted before 1950 which the writer has examined employ final earnings as a basis for benefits. For plans containing this type of provision, inflation creates additional past service liabilities.[4]

The concept "actuarial soundness" has been given various interpretations in the funding of private pension plans.[5] Agreement must be reached in this area before estimates can be made as to the ultimate size of pension reserves. If actuarial soundness means that deposits must be made in sufficient amounts to meet fully, at any cut-off date, all obligations based on service up to that time, reserves may well approach seventy-five billion dollars.[6]

Before proceeding with the analysis, it should be pointed out that private pension funds do not constitute a wholly independent investment channel. Approximately ninety per cent of the plans existing in 1951 were underwritten by insurance companies.[7] Inasmuch as nearly two-thirds of the persons covered are under uninsured pension trusts, however, the average size of insured plans is relatively small. The size differential between insured and uninsured plans suggests that expanding programs may be induced to establish their own trusteed funds eventually. A case in point is F. W. Woolworth which decided to operate its own pension trust subsequent to 1950.

Estimates made by the Federal Security Agency suggest that reserves behind insured plans are relatively greater than those behind trusteed plans. At the end of 1951, total reserves held by each group were roughly equal. If these estimates are valid, the future flow of pension funds into "trusteed" reserves may well exceed that into "insured" reserves.

II

The relationship between private pension plans and the social security program cannot be ignored. The pension programs of such corporations as Allied Chemical and Dye, General Mills, Glenn L. Martin, Hudson, Packard, Republic Steel and United States Steel provide specifically for the reduction of indi-

[3] Bankers Trust Company, *Industrial Retirement Plans—1953 Edition*, pp. 14–5.

[4] See C. R. Henderson, "A Better Pension Program," *Harvard Business Review*, (January-February, 1952), p. 62 for a discussion of this point.

[5] J. E. McMahon, "Experts Are Split by Pension Issue," *New York Times* (Financial Section), May 24, 1953.

[6] In deriving this figure, it is assumed that the average annuity is $600, that the interest rate is three per cent, that thirty million persons are covered and that there are five million persons receiving benefits.

[7] National Planning Association, *op. cit.*, p. 10.

vidual benefits by the amount, or in some cases by half the amount, of social security payments. Inadequacies in social security benefits have undoubtedly stimulated in part the extension in coverage of private pension plans. Improvements in the social security program tend, on the other hand, to be retarded by the presence of private pension programs.

The Old Age and Survivors Insurance program resembles private insurance programs in a very superficial fashion. A proportional tax, up to a specified maximum, is levied upon the insured person and his employer.[8] The receipts from this tax flow into a special fund and are exchanged for United States Government securities. At the same time the Social Security Administration assumes an obligation to pay certain benefits in accordance with the Social Security Act.

Here the similarity ends. The Social Security Act is subject to change at any time. The benefits paid under the Act do not necessarily correspond to the payments made by the insured person. Because of this fact and of the compulsory nature of the social security tax, the tax cannot be regarded as a *price* paid for pension benefits.

The basis for social security reserves is noticeably weaker than that for private insurance reserves. The real burden of providing old-age benefits in the future cannot be placed upon the present generation by accumulating reserves.[9] An excess of social security tax receipts over benefits paid out exerts at any given time a deflationary or contractive influence upon the economy unless counteracted by a general budget deficit. An excess of social security payments over receipts has an expansionary effect.

Since the social security reserve is composed of United States Government securities, its liquidation and the utilization of interest income to finance benefit payments involve the transfer of funds from the general governmental account. As long as the federal government assumes the responsibility for stabilizing the economy, the social security program cannot be operated in isolation from other governmental programs. Thus the creation of special reserves and the earmarking of taxes means little.[10]

In contrast, the establishment of adequate reserves is essential to the successful operation of private pension plans. Private corporations possess neither the permanence of the federal government, its money raising and creating powers, nor its ability to disregard commitments. Private pension reserves have the clearly defined function of guaranteeing the defrayal of existing obligations.

As a general rule private pension reserves are not, and should not be, held in the form of securities of the originating company.[11] Whenever the financial

[8] It is presumed with some reason that the primary burden of the tax falls upon the employee. To the extent that the tax induces varying readjustments in product prices, however, the entire economy is affected.

[9] E. J. Swan, "Economic Aspects of Social Security," *Postwar Economic Studies*, Board of Governors of the *Federal Reserve System*, Number 6 (June, 1946), p. 50.

[10] *Ibid.* Psychological repercussions attributable to popular misconceptions are ignored.

[11] R. F. Murray, "Investment Aspects of the Accumulation of Pension Funds," *Journal of Finance*, Vol. VII, No. 2 (May, 1952), p. 255.

strength of a corporation is such that little risk is attached to substantial investment in its own securities for pension fund purposes, pension reserves are clearly unnecessary. The term "risk," as used in this context, clearly possesses a very long-run connotation.

Even though adequately supported by reserves, private pensions cannot serve as an effective substitute for public pensions. The ability of companies to finance pensions varies widely, and a program of private pensions is not capable of uniform coverage. Pension fund contributions cannot be geared to worker productivity unless wages are universally adequate. Otherwise, the lower paid workers must be subsidized. As long as workers are hired on an individual, rather than group, basis, firms cannot achieve the assumed aim without sacrificing profits.

As contrasted with social security, private pension plans contribute to the inflexibility of the economy. The presence of additional long-term commitments reduces the ability of private companies to adjust price and wage policies to changed circumstances. Escape clauses ordinarily contained in pension plans ignore moral responsibilities and are unutilizable except in extreme situations. The possibility of adjusting annual contributions to pension funds in accordance with the level of prosperity offers a measure of relief.[12] Only in the case of deferred profit sharing plans, however, is this type of inflexibility completely avoided.

To the extent that pension benefits are reduced by changing jobs, worker mobility is adversely affected. Some corporations, e.g., Atlantic Refining, go so far as to provide that "engaging in competition terminates benefits." The significance of the mobility factor depends upon the degree to which future benefits are discounted by younger workers and upon the degree to which worker mobility varies inversely with age.

It should be observed that the objectives of private pension programs often extend beyond those of social security. A number, for the most part contributory plans, are designed specifically for executives and higher salaried employees. Objectives other than that of offsetting the inability of low income workers to save are to facilitate the retirement of superannuated personnel, to reduce turnover, to provide additional incentive, and to gain tax benefits for the employee.

While these purposes do not appear objectionable unless worker mobility is unduly affected, private pension plans do not appear to merit special tax treatment. Company contributions should be regarded as income to the employee for tax purposes. If the prevailing tax treatment is regarded as a partial recognition of the depreciation factor as applied to human beings, a more equitable remedy is to tax earned income at a somewhat lower rate than unearned income.

## III

The National Planning Association states that, on the basis of 1951 prices, the average yearly increase in private pension funds during the next ten years

[12] *Ibid.*, p. 252.

may well be around two billion dollars or somewhat more.[13] If interest income is included, the annual rate of growth may approach three billion dollars.

Several reasons exist for believing that the expansion of private pension funds tends to augment the aggregate flow of savings.[14] Insofar as lower income workers are concerned the case is obvious. Members of this group are not voluntary savers to any significant degree and are unable to offset accumulating pension benefits by reduced voluntary savings. Middle income workers, who are in a position to save, often do so inadequately through lack of foresight. Since company contributions to pension trusts are not regarded as currently taxable income to the employee, the savings of high salaried persons are also likely to increase.[15]

Inasmuch as a changed flow of savings affects the level of income, it need not change actual net saving correspondingly. Thus the hypothesis that the expansion of private pension funds augments the aggregate flow of savings is not statistically verifiable. Despite this fact it is interesting to note that the available data do not contradict the hypothesis. According to Department of Commerce figures, net saving as a per cent of disposable income averaged seven per cent for the years 1950–1952, as compared with slightly over four per cent for the years 1929, 1930, 1939, and 1940.[16]

During inflationary periods the effect of an augmented flow of savings may not be readily apparent. Under such circumstances the concept "augmented flow of savings" refers not simply to a dollar increase in savings which is likely to occur anyway, but rather to an increase in savings relative to that in income. Since the existence of general price rises implies that the demand for goods exceeds the current value of the output, an increment to the flow of savings may merely slow down the rate of increase in prices.

An increased flow of savings has of course beneficial effects, provided the economy is characterized by inflationary tendencies. It reduces the task of the federal government in combatting these tendencies. Since the increased supply of savings can be absorbed by transferring government securities from banks to the groups holding these funds, an augmented flow of savings into the capital market need not influence greatly the flow of new investment.

If continued inflation is not the order of the day as may well be the case with the restoration of a peacetime economy, the expansion of private pension funds has interesting implications. To point up these implications let us assume that the economy is at an equilibrium position in the neighborhood of full employment and that the current flow of new investment is largely independent of

[13] National Planning Association, *op. cit.*, p. 50.

[14] See H. G. Guthmann, "Effect on the Economy of Channeling Savings Through Pension Funds," *Journal of Finance*, Vol. VII, No. 2 (May, 1952), p. 271.

[15] In this case, by the amount of the tax reduction. Since ours is a growing economy with an ever increasing tax base, increased company contributions do not necessarily suggest declining tax revenues. The possibility of offsetting dissaving on the part of government is therefore ignored.

[16] *Economic Report of the President*, January, 1954, Table G-10, p. 177.

the flow of savings.[17] Given these conditions, an augmented flow of savings resulting from the growth of private pension funds induces both deflation and unemployed productive resources.

Maintenance of full employment necessitates a balancing of the demand for consumption and investment with the current value of output at that level. If funds which would otherwise be used for consumption flow into pension funds, this relationship is disturbed. Prices and physical output tend to fall until the balance is restored.[18] Since the demand for goods is likely to decline as national income falls, an augmented flow of savings amounting to, say, two billion dollars will cause a much larger decline in national income.[19]

In order to give the analysis a dynamic orientation attention should be directed to the fact that the productive capacity of the economy is continuously expanding and that the economy is presumably adjusted to this condition. An augmented flow of savings need not actually reduce national income. It may simply retard the growth of national income and thereby leave unemployed resources.

Let us now make the very reasonable assumption that the government considers itself responsible for maintaining a high level of income and employment. Given the preceding conditions, an augmented flow of savings must be compensated for by a corresponding increase in deficit spending on the part of government. Unless the government resorts to the printing presses the expansion in private pension funds may therefore be paralleled by an expansion in the federal debt.

In view of the conservative orientation of the investment policies of pension trustees much of the increase in federal debt may ultimately be held in private pension funds. This result is similar to that which would occur if the government directly supplemented the existing social security program. It is, moreover, subject to the difficulties enumerated in the preceding section.

## IV

Although the assumption of independence between an augmented flow of savings attributable to the expansion of private pension funds and the flow of new investment has its origins in the Keynesian framework, its validity is not immediately apparent.[20] Funds flowing into pension trusts are not hoarded, but rather seek outlet in the capital market. In terms of ordinary demand and supply analysis an increased supply of funds should encourage new investment.

Pension funds compete in the capital market(s) for income-producing claims

[17] Investment in this context means investment in newly created physical assets, such as plant, equipment and inventories. The "flow of savings" concept should not be confused with that of "saving" in the Saving-Investment identity. Saving has an *ex post* connotation which "flow of savings" does not.

[18] Physical output (final product) multiplied by prices yields of course national income.

[19] In Keynesian terms this is called the multiplier concept.

[20] For our purposes, "a lagged relationship" can be substituted for "independence."

on wealth.[21] The money values of these asset claims are bid up, and their yields drop correspondingly. As yields, i.e., the cost of borrowing, decline organizations which do the actual investing in plant, equipment and other items are induced to offer new security issues. Investment, formerly submarginal due to its low rate of return, becomes worthwhile.

The analysis cannot, however, be concluded at this point. The degree of stimulus to investment flow of an augmented flow of savings is conditioned by shifts in the demand for funds to invest, by the nature of the capital market, and by the importance ascribed by management to the cost of borrowing.

By definition an augmented flow of savings reduces the demand for consumption goods below what it otherwise would be.[22] The diminution in consumption demand is counteracted in part by the creation of capital gains as the money values of claims on wealth are bid up. Recipients of capital gains, on a group basis, can normally be expected to increase their expenditures for consumption goods somewhat, as well as to seek other investment outlets.

To the extent that a net reduction occurs in consumption demand, the expected rate of return on new investment goods is adversely affected, and the demand for funds to invest falls. The change in demand for funds may lag behind the change in supply of savings, provided the reduction in consumption demand is unanticipated. If the conditions which brought about the increased flow of savings persist, however, the encouragement to new investment engendered by reduced borrowing costs may be counteracted at least in part by expectations of lower rates of return.

Pension funds are not an important source of risk capital; quality is a prime consideration in portfolio determination. The defensive nature of their holdings is shown by a recent Commercial Clearing House survey which finds the average return on pension fund investments to be 3.41 per cent. Thus the primordial consequence of an increased flow of these funds into the capital market is to bid up the money values of *safe* claims on wealth.

If it is granted that the capital market has numerous, imperfectly related subdivisions ranging from ultra safe (government securities) to ultra risky (securities of small, newly created firms), the first order effects of pension fund increases may not appreciably alter the flow of funds into risky channels. By "imperfectly related" is meant simply that the great majority of investors in *safe* securities are unwilling for one reason or another to sacrifice quality for yield within significant ranges of yield variation. Reduced yields in the *safe* markets redirect the flow of funds somewhat, but not enough to restore completely the relative yield structure. The more imperfectly related and numerous the subdivisions, the smaller is the probability that a sizeable amount of the added funds will spill over into the *risky* markets.

[21] Claims on wealth comprise preferred and common stock, public and private bonds, and other specific or general titles to wealth. Because of their minor importance as pension fund investments, direct investment in, and operation of, physical assets is ignored.

[22] Saving is defined as that part of income which is not consumed. The phrase "below what it otherwise would be" is employed to point up the fact that, in a growing economy, an *absolute* decline in demand for consumption goods may not occur.

It may be argued that for every purchase of *safe* securities there is a sale and that, unless the money receipts are hoarded, additonal funds must eventually flow into *risky* markets.[23] As implied by the "preferred asset ratio" concept, however, augmented hoarding is a reasonable consequence of rising money values for *safe* claims on wealth.[24] Hoarding, i.e., holding money, provides protection against subsequent declines in the price of these securities. In addition the concomitant reduction in security yields lessens the cost of such protection.

Another consideration which diminishes the force of the preceding argument is the existence of substantial bank holdings of government securities. An increased flow of funds into the *safe* markets encourages the transfer of government securities from banks to non-bank, private investors. If the transfer is made from commercial banks, the money supply declines correspondingly unless counter-balanced by increased loans to the public. If from Federal Reserve Banks, both the money supply and the reserve position of commercial banks are adversely affected. Thus the effect may be analogous to that of hoarding.

The implicit assumption underlying our discussion of the quasi-competitive capital markets is that additional funds must flow into *risky* markets for the flow of investment to be greatly affected. Considerable attention is given to this point in the succeeding section. Suffice it to say for the present that availability of funds at reasonable rates, or at no explicit cost (retained earnings), is a significantly less important factor for "blue chip" firms than for speculative ventures.

The significance of borrowing cost as a factor determining the flow of new investment is open to question. The role of retained earnings as a major source of funds for new investment suggests that the magnitude of profits may be an even more important consideration. Corporations frequently dislike to borrow because of the inflexibility imposed thereby. As the cost of borrowing varies, other changes, e.g., in the price structure, may occur which outweigh its influence. Furthermore, changes in the cost of borrowing do not affect all types of investment equally. The longer the investment period, the greater is the effect.[25]

Our conclusion is that the assumption of independence between the flow of savings and the flow of investment may serve as a reasonable first approximation. An augmented flow of pension funds into the capital market can be absorbed by increasing the money values of existing claims on wealth which in turn leads to greater hoarding and to the transfer of government securities from banks.

It should be pointed out that our basic argument may be valid even if the assumption of independence is modified. Let us suppose that an augmented flow of savings stimulates the flow of new investment, but only after an appreciable lag. During the interval of the lag, the level of income and employment will be adversely affected. Under such conditions, it is entirely possible that the federal government will be unwilling to refrain from deficit financing long enough to permit the necessary adjustments to take place.

[23] R. F. Murray, *op. cit.*, pp. 257–8.

[24] See K. E. Boulding, *A Reconstruction of Economics* (New York: John Wiley and Sons, 1950), pp. 26–50.

[25] In the case of public utilities where the investment period is extremely long, however, government regulation of rates may completely outweigh the influence of this factor.

V

The foregoing analysis is based upon the assumption that the expansion of private pension funds augments the flow of savings. Let us extend the analysis one further step by supposing that the flow of savings is not increased, but rather redirected through different channels.[24] It may be that the federal government will still feel impelled to finance indirectly the growth of private pension funds.

Attention has already been drawn to the numerous, imperfectly competing subdivisions of the capital market. To simplify the analysis let us assume that these subdivisions among which the flow of funds is restricted can be reduced to two major categories: the *safe* market and the *risky* market. Let us also suppose that the expansion of private pension funds increases the supply of funds flowing into the *safe* market and decreases the supply of funds flowing into the *risky* market.

Because of the tremendous volume of previously issued securities present in the *safe* market, an augmented flow of funds into this market is not likely to influence yields appreciably in the short run. An annual increment of even two billion dollars represents a very small percentage of the market value of those *safe* securities which are already outstanding. Unless the demand for funds to invest by "blue chip" companies is highly elastic, therefore, the increased investment flow in the *safe* sector will be significantly less than the magnitude of redirected saving. Some conception of the requisite elasticity can be obtained by observing that the yearly growth in private pension funds approaches thirty per cent of the dollar amount of all new security issues.

In the *risky* market availability of funds, rather than willingness to invest, appears to be the crucial factor. Funds withdrawn from this market may well occasion an almost one-for-one decrease in the flow of *risky* investment. Thus the combined effect of the redirected flow of saving seems to be a diminution in the flow of investment.

There exists the further possibility, within the *safe* capital market, that direct investment channels will be replaced by indirect investment channels. That is to say, a portion of the retained earnings which would have been immediately available for investment in physical assets may be diverted into private pension funds. This consideration will be treated as a supplement to, or modification of, the preceding argument.

In order to determine the plausibility of the foregoing hypothesis it is necessary to ascertain the types of claims on wealth held in private pension funds, to isolate the investment channels whose supply of funds is decreased by the expansion of private pension funds, and to contrast the direction of flow of funds through the affected channels with that through private pension funds. Inasmuch as a sizable portion of private pension programs is administered by life insurance companies, the asset holdings of these organizations are examined in conjunction with those of trusteed funds.

[24] It may alternatively be assumed that the flow of savings is augmented, but not by the full amount of the expansion in private pension funds.

The investment policies of life insurance companies are essentially conservative and are restricted in varying degrees by state legislation. Significant features include the emphasis upon real estate mortgages and the reluctance to hold preferred and common stocks. The interest in government securities has declined over the past decade, but may again be stressed, provided either yields continue to rise or alternative investments become relatively scarce. The percentage amounts of the various claims on wealth held by life insurance companies at the end of 1952 are shown below:[27]

| *Asset* | *Per cent of Total* |
|---|---|
| United States Government Securities | 14.0 |
| Other Government Bonds | 3.4 |
| Railroad Bonds | 4.8 |
| Public Utility Bonds | 16.3 |
| Industrial Bonds | 18.7 |
| Stocks | 3.3 |
| Real Estate Mortgages | 29.0 |
| Real Estate | 2.6 |
| Policy Loans | 3.7 |
| Miscellaneous Assets | 4.2 |
| | 100.0 |

As might be expected the investment policies of trusteed funds possess notable similarities to those of life insurance companies. Several trusteed plans, e.g., those of American Telephone and Telegraph, Coca-Cola, Hudson, International Paper and Schenley, provide specifically for the limitation of investments to securities which are legal for life insurance companies in New York. The similarity in orientation is further evidenced by the fact that organizations which specialize in the administration of trusteed funds are for the most part divisions of large commercial banks.

Although attention is restricted to investment-grade securities, the investment policies of trusteed funds exhibit greater latitude than those of life insurance companies. Trusteed plans lack the established tradition and historic responsibilities of life insurance firms. Despite the similarity of investment requirements, trustees are ordinarily less circumscribed by legal restrictions, e.g., the prudent-man rule. The presence of variable dollar liabilities in some cases necessitates a degree of protection against price-level changes. Since insured pension programs entail less effort on the part of management, moreover, trusteed plans would very likely be in disfavor unless their investment return is expected to be higher than the return on investment of life insurance companies.[28]

In an effort to obtain information as to the asset composition of trusteed funds the writer has corresponded with fifty-three large corporations which sponsor trusteed plans. Of the twenty-one corporations which furnished data on the types

[27] Institute of Life Insurance, *Life Insurance Fact Book*, 1953, pp. 57–78.

[28] For confirmation, see National Planning Association, *op. cit.*, p. 51. This is of course not the entire story. Corporations may in some instances prefer trusteed plans because they do not desire to fund their plans completely.

of assets held in their pension fund, thirteen provide a sufficiently detailed breakdown for comparison with life insurance company holdings. The combined asset holdings of these thirteen trusteed funds are substantially in excess of two billion dollars. Among the diverse types of claims on wealth in which these funds invest are included public utility, railroad and industrial bonds, comprising about seventy per cent of the total; United States Government securities, comprising about thirteen per cent; preferred and common stocks, comprising about twelve per cent; and cash, comprising about four per cent.[29]

Mr. R. F. Murray, Vice President of Bankers Trust Company, states that:[30]

> . . . it is safe to say that currently trusteed pension funds are being invested almost entirely in corporate bonds and stocks. Mortgages and real estate investments are relatively unimportant and net purchases of United States Government securities are probably not substantial. The proportion of annual additions going into common stock is also very difficult to determine, but it seems doubtful that it amounts to more than twenty per cent.

In explaining the absence of pension funds from the mortgage market he points out that "handling cost must come out of the yield, and, as a consequence, the differential between FHA and VA mortgages and good quality corporate bonds becomes very small."[31]

A recent estimate places the typical ratio for investment in common stock at twenty-five per cent, with five per cent or more in preferred stocks. Corporate bonds are believed to account for fifty-five per cent, while government securities comprise the remainder.[32] The emphasis upon quality and upon defensive holdings is shown by the fact that, according to the CCH survey, one-fifth of all common holdings are utility stocks, while another fifth is divided between banks and chemicals.

No consensus exists as to the proportion of funds being invested in common stocks. The fact that the writer's survey covered the older, better established funds tends to introduce a conservative bias. Most of the higher estimates, moreover, presumably relate to the proportion of *new* funds being invested in equities, rather than to the distribution of the entire portfolio of private pension funds.

These data confirm the proposition that the expansion of private pension funds tends to direct the flow of savings into the *safe* capital market. The next step is to inquire which investment channels are likely to experience a diminished supply of funds.

Although precise determination is impossible, the growth of private pension funds appears to affect the flow of savings available for *direct* investment by life

[29] Since these percentages are derived from a mixture of 1951 and 1952 data and are based upon such a small sample, they are merely intended to be suggestive.

[30] R. F. Murray, "Pension Funds and the Capital Market," *American Economic Security*, October–November, 1952, p. 38.

[31] R. F. Murray, "Pension Funds as a Market for Mortgages" *Commercial and Financial Chronicle*, January 29, 1953, p. 18.

[32] "Private Pension Plans," *Monthly Review of Credit and Business Conditions*, Federal Reserve Bank of New York, Vol. 35, No. 12 (December, 1953), p. 188.

insurance companies, nonfinancial corporations and individuals. In the case of life insurance companies the adverse effect is probably more than counteracted by the fact that approximately two-fifths of the private pension funds annually seeking investment outlets are controlled by life insurance companies under insured programs.

The inclusion of nonfinancial corporations as one of the affected parties assumes that a portion of the pension fund contributions come out of what otherwise would be profits. A combination of union pressure and threatened price controls may induce firms to absorb part of the burden by neither raising product prices nor reducing wages to the full extent of the pension costs. Difficulties involved in adjusting dividend rates downward may, moreover, cause the brunt of this absorption to fall upon retained earnings.

A diminution of retained earnings adversely affects the flow of new investment. Nonfinancial corporations both undertake a significant part of the actual investing in newly created assets and rely heavily upon retained earnings as a means of financing this new investment. It cannot be presumed even in situations where the anticipated risk is small that nonfinancial corporations will resort to the capital market in order to offset a reduction in retained earnings. The issuance and sale of new claims on wealth endangers flexibility and augments explicit costs.

Given no increase in the aggregate flow of savings, the flow of savings available for direct investment by individuals must decrease as private pension funds expand. This result obtains from efforts to maintain the level of real, as opposed to money, expenditures for consumption despite either higher product prices or lower wages (excluding pension premiums). Since individuals represent a major source of risk capital, the expansion of private pension funds is likely to reduce the demand for new investment from this source.

An important characteristic of both nonfinancial corporations and individuals is that the capital market need not be interjected as an intermediate step between saving and investing. The savings of both groups may be employed directly to acquire newly created physical assets, such as plant, equipment and inventories. Thus a reduction in savings available for direct investment by these groups clearly influences the flow of new investment.

The influence of funds flowing into the capital market upon the flow of new investment is clearly less distinct. By "capital market" is meant the mart in which funds are offered to the highest bidders consistent with quality and other criteria, it being understood that the supplier and user are different persons (or groups of people) and that the supplier has little concern over the use of funds except to insure safety of principal. Unless restricted by governmental action, such as price supports on government securities, an augmented flow of funds into the capital market(s) raises the money values of existing claims on wealth and lowers yields. The reduced yields *may* encourage the issuance of new claims on wealth and an increased flow of new investment, provided those who do the actual investing in physical assets are receptive and possess the proper credit credentials.

The conclusion to be drawn is that the initial hypothesis is plausible, pro-

vided the assumptions are modified somewhat. The principal amendment is that the investment channels which are likely to experience a diminished flow of savings as private pension funds expand are closer to the actual investment process than are insurance companies and pension trustees. This factor, together with the augmented flow of saving into the *safe* markets, should occasion a diminished flow of investment.

In order to simplify the analysis the existence of continuous increments to productive capacity, i.e., the presence of a growing economy, has been largely ignored. The inclusion of this factor does not alter the conclusions. Its presence simply means that the flow of savings available for direct investment by individuals and nonfinancial corporations and the aggregate flow of investment may not experience absolute decreases. Instead, the flows may be less than they *otherwise would have been.*

## VI

The foregoing analysis suggests that, with the disappearance of inflationary pressures from the economy, the federal government may well be forced to finance indirectly the expansion of private pension funds. If this is so, a more adequate social security program which alleviates the need for private pension programs appears to be the appropriate governmental policy. By their very nature private pension plans can provide neither the uniform treatment, the permanence, nor the extended coverage of a public program. As the National Planning Association points out, moreover, "it is quite likely that the inability of any big collective bargaining plan to continue would result in pressure for government to assume the liabilities of the plan."

Because of the possible retarding effect on amendments to the social security program, management should not be too hasty in expanding private pension plans whose primary purpose is to provide acceptable minimum retirement incomes for employees. If coerced into this position by union pressure, management should continue to provide for the reduction in private pensions as social security benefits increase.

Private pension programs which have other objectives may not be objectionable. They should, however, be voluntary in nature. They do not appear to merit special tax treatment.

# COMMUNICATION

## *THE AMERICAN CAPITAL POSITION IN FOREIGN TRADE: A COMMENT*

In a fairly recent article, Professor Wassily Leontief presented input-output data as to total labor and capital inputs embodied in American exports and input-substitutes.[1] From these data, Leontief concluded that—as compared with the rest of the world—the United States' economy is characterized by a relative surplus of labor and a deficiency of capital. Professor P. T. Ellsworth has used the same data to reach the opposite conclusion.[2] It is the purpose of this note to present the view that any such data concerning labor and capital requirements for the production of internationally traded commodities are irrelevant to the question of whether the comparative advantage of the United States lies in labor or in capital;[3] that the effort to treat this question through the input-output technique is a misguided one; and that the very posing of the question leads to treating the problem of comparative costs on such an aggregative level as to deprive it of operational meaning.

Leontief concludes from his data that the American " . . . exchange of domestically produced goods for competitive imports serves as a means to compensate for the comparative shortage of our domestic capital supply and a corresponding over-supply of American labor;"[4] in short, that the United States is a net importer of capital-inputs and a net exporter of labor-inputs. Ellsworth argues the reverse case, that the United States is " . . . an exporter of capital-intensive and an importer of labor-intensive products."[5] It seems to this writer that the respective cases can be expressed in the following formulae:

For Leontief, United States net exports of capital-inputs and labor-inputs per million dollars worth of trade moving in each direction are equal to

$$f_a(m) - f_a(n)$$

For Ellsworth, these net exports are equal to

$$f_a(m) - f_b(n)$$

Where

$f_a(m)$ = capital and labor needed for the production of one million dollars worth of United States *exports* by the methods actually in use in the United States

[1] "Domestic Production and Foreign Trade; the American Capital Position Re-Examined," *Proceedings of the American Philosophical Society*, 28 Sept., 1953, Vol. 97, No. 4.

[2] "The Structure of American Foreign Trade: A New View Examined," *The Review of Economics and Statistics*, Aug. 1954, XXXVI.

[3] For purposes of this note, I join with Ellsworth in uncritical acceptance of the Leontief data themselves.

[4] *Op. cit.*, p. 349.

[5] *Op. cit.*, p. 283.

$f_e(n)$ = capital and labor needed for the production of one million dollars worth of United States *imports* by the methods actually in use in the United States[6]

$f_s(n)$ = capital and labor needed for the production of one million dollars worth of United States imports by the methods actually in use in the economies of the trading partners of the United States (with appropriate weighting for different countries).

Leontief's formula tells us whether the United States, by engaging in trade, is using more or less capital and labor than would be needed to produce at home the imported bill-of-goods.[7] Ellsworth has correctly noted that nothing is necessarily implied here concerning comparisons between the labor and capital supplies in the United States and in the countries which trade with it. Since the formula deals only with the United States, no proper implication may be drawn as regards comparative advantage between countries.

| | Country I | Country II |
|---|---|---|
| *Factor Costs (in International Currency Units)* | | |
| One efficiency unit of capital | 2 | 7 |
| One efficiency unit of labor | 8 | 3 |
| *Costs of Production of Products A and B* | | |
| Product A | | |
| a. Produced with 1 unit capital and 2 units labor | 18 | 13 |
| b. Produced with 2 units capital and 1 unit labor | 12 | 17 |
| Product B | | |
| a. Produced with 1 unit capital and 2 units labor | 18 | 13 |
| b. Produced with 3 units capital and 1 unit labor | 14 | 24 |

The formula presented to express Ellsworth's position shows that Ellsworth is concerned with production conditions both in the United States and in the rest of the world. The formula is intended to indicate whether the United States uses more units of capital-inputs and fewer units of labor-inputs in producing her exports than the rest of the world requires to produce America's imports.

[6] Leontief deals only with competitive imports.

[7] Leontief's explicit statements of his argument are limited to this presentation. (Cf. *op. cit.*, pp. 339 and 332–333.) It should be noted that a strong assumption is involved even here; namely, that constant costs prevail on an industry basis in the United States production of both exports and import-substitutes and thus that methods of production would not change if the production of exported items was reduced by one million dollars and if the production of import-substitutes was correspondingly increased.

Since Ellsworth believes that this is the case, he is able to conclude that the United States is a net exporter of capital-inputs and a net importer of labor-inputs.[8] It should be pointed out, however, that the United States might be a net exporter of capital-inputs and a net importer of labor-inputs in Ellsworth's sense, and yet find that the production of import-substitutes in place of exports would increase American use of capital while reducing American use of labor.[9] A two-country, two-commodity case will illustrate this point.[10]

In the above case, Country I will export Product A, produced by method "b," in exchange for Product B, produced in Country II by method "a." In view of the differing costs of production, thirteen units of A will exchange for twelve units of B. Here Country I is a net exporter of capital-inputs and a net importer of labor-inputs in the Ellsworth sense; for she requires more capital and less labor for her exports of Product A than her trading partner needs to produce Country I's imports of Product B. But Country I is a net exporter of labor-inputs and an importer of capital-inputs in the Leontief sense of using more labor and less capital in producing her exports of Product A than she would have needed to produce at home the twelve imported units of Product B.

Let us now ask whether it is true that a country with a capital supply/labor supply ratio[11] which is higher than that of its trading partners will have net exports of capital-inputs in exchange for net imports of labor-inputs. The above example indicates that Ellsworth is correct in answering "yes" within the context of his own use of the terms, but that this answer carries no proper implication that through such trade the country will economize on labor at the expense of capital. Without such an implication, however, one might well question the significance of the Ellsworth answer.

Leontief's answer is also, by implication, "yes." Here, however, Leontief means that the economizing of labor at the expense of capital is achieved through trade. As Ellsworth has pointed out, this is by no means necessarily the case if differing methods of production are used in different countries. In fact, it was not the case in our example above of the exchange of thirteen units of Product A for twelve units of Product B. Leontief's answer requires the assumption either that there is only a single method possible for the production of imports and import-substitutes or that the commodity imported is not of type B, but of a third type, C.

[8] This is not Ellsworth's terminology. But it appears to this writer as the only meaning which can be given to Ellsworth's statement that the United States is an exporter of capital-intensive and an importer of labor-intensive products.

[9] Throughout this note, production will be treated as though only the two internally-homogeneous factors of labor and capital need be considered. In this treatment, the writer is following the example of both Leontief and Ellsworth.

[10] In the following examples, both labor and capital will be measured in efficiency units. These may be interpreted either as identical with natural units (following Ellsworth's interpretation with respect to labor), or, following Leontief, as representing different numbers of natural units in different countries.

[11] Both measured in efficiency units.

*Cost of Production of Product C*

| | In Country I | In Country II |
|---|---|---|
| a. Produced with 1 unit capital and 2 units labor | 18 | 13 |
| b. Produced with 1.75 units capital and 1.25 units labor | 13.5 | 16 |

Here Country I, with the higher ratio of supplies of capital to labor,[12] exports thirteen units of Product A in exchange for twelve units of Product C.[13] Due to the differing methods of production found profitable in the two nations, Country I uses five more units of capital and two fewer units of labor in exporting Product A than she would have used in producing at home the twelve units of Product C.

Thus we see that there is no way of knowing whether a nation relatively well supplied with capital will have net exports or imports of capital-inputs when the term "capital inputs" is used in Leontief's sense.

From this conclusion, it seems to the writer that certain deductions may be made concerning the results arrived at by Leontief and Ellsworth.

Leontief concludes from his data that capital is scarcer than labor in the United States (compared to other countries). Ellsworth concludes the opposite from the fact that American import-substitutes contain more capital-inputs than do American exports;[14] he reasons that the production of import-substitutes requires an "exceptionally great use of our cheap factor, capital, in order to offset the advantage derived by other countries from their cheap labor."[15] In this writer's view, the Leontief data do not support either conclusion. A country with a relative capital surplus may find that foreign trade leads to the economizing of labor at the price of requiring more capital (e.g., the export of Product A for Product C), but it may equally find that it is economizing capital at the expense of labor (e.g., the export of Product A for Product B).[16] Without rather specific assumptions as to the extent to which labor and capital are mutually substitutable, there is no presumption as to whether Product C or B is the more typical competitive-import.

[12] This is shown by a comparison of the cost of an efficiency unit of capital compared to an efficiency unit of labor in the two countries.

[13] For Ellsworth, of course, the United States is represented by Country I; for Leontief, it is represented by Country II (with the comparative advantage in labor).

[14] Ellsworth does not make this reasoning fully explicit, but it seems the only basis for his declaring that the Leontief data support the commonsense view that it is labor which is relatively scarce in the United States. (*Op. cit.*, p. 279.)

[15] *Ibid.*, p. 284.

[16] Another way of making the same point is to say that, in comparing two commodities, we cannot properly use the term "capital-intensive" to apply to one of them unless at all relevant national scales of output, and at all relevant factor prices, the ratio of capital to labor needed for the production of this commodity will be greater than the ratio needed for the production of the commodity with which it is being compared.

Leontief and Ellsworth also clash with regard to whether a relative growth in the capital supply/labor supply ratio in the United States would provide an additional or diminished incentive to international trade. For the same reason given above, it is this writer's opinion that there is no necessary presumption in either direction to be drawn from the Leontief data.

These views of the writer stem from the earlier conclusion that the Leontief data are irrelevant to the question of whether the United States has a comparative advantage in labor or in capital. Once we accept Ellsworth's view that radically different methods of production may be used in different countries, then it would appear that no type of data regarding the composition of international trade is relevant to the issue.

What sorts of data would be relevant? Ellsworth suggests that the answer is relative factor prices.[17] But, as Leontief correctly shows, the relative prices which are relevant are those for efficiency units. Rather arbitrarily, Leontief assumes that one-third of an American man-year of labor is equivalent in efficiency units to an entire man-year of foreign labor. Ellsworth prefers to treat all natural units of labor as equivalent to efficiency units, bringing in other cooperating factors[18] as responsible for the higher labor productivity in the United States. Because of his different treatment, Ellsworth's answer is the opposite of Leontief's as to whether labor is relatively expensive in the United States.[19]

Since Leontief's three-to-one ratio is clearly arbitrary, while Ellsworth's defense of his one-to-one treatment seems to be solely that of avoiding "conceptual awkwardness,"[20] we would appear to be hopelessly embroiled in a definitional morass. No possible statistics as to general wage rates could provide a satisfactory answer as to whether costs per efficiency unit of labor are relatively high in the United States.

To pursue the question of relative factor costs, we would then be forced to depend on stray scraps of information from firms in different countries which use roughly identical production methods[21] to produce similar products. Here we might get data as to relative factor prices. But one would certainly hesitate to extrapolate from such data to reach conclusions regarding national comparative advantage.

Thus, once we accept Ellsworth's view that radically differing production methods are employed in different countries, no possible statistics would seem to bear on the question of whether American comparative advantage lies in capital or in labor. In fact, this writer would suggest that the very question is not a meaningful one. With varying qualities of labor employed in different

[17] *Ibid.*, p. 283.

[18] Entrepreneurship and natural resources. (*Ibid.*, p. 283.)

[19] Ellsworth's statement that interest rates are lower in the United States (*ibid.*, p. 283) does not seem to the point, since such rates are affected by other factors in addition to that of the relative supply of capital and labor.

[20] *Ibid.*, p. 283.

[21] But with more than one workman in other countries performing the duties which would be carried out by one worker in the United States.

countries, we would expect profoundly different organization of production relationships between firms[32] as well as the use of different types of capital equipment. The very concept of an efficiency unit of labor may be unfruitful, since different qualities of labor are best combined with different types and amounts of other production factors.

Leontief began his article with the statement that "the theory of comparative costs . . . reigns . . . in the pages of college textbooks without actually governing the practice of empirical economic analysis." The purpose of his article was to apply it to "the analysis and explanation of actual foreign trade relationships."[33] This writer would suggest that such an effort is misguided. To the extent that the theory of comparative costs can be fruitfully treated in terms of such comprehensive aggregates as "capital" and "labor," it is only for the sake of laying down broad analytic principles. These aggregates must be broken down before any useful analysis can be made of the comparative advantage of a specific country at a particular time in history.

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[32] E.g., extensive subcontracting relationships are only practicable if the subcontracting firms can maintain production tolerances which have been agreed upon.

[33] *Op. cit.*, p. 332.

# BOOK REVIEWS

*Elements of Pure Economics or the Theory of Social Wealth.* By Leon Walras. Translated by William Jaffé. Homewood, Ill.: Richard D. Irwin, 1954. Pp. 620. $7.50.

It is very fitting that this first English translation of Walras' *Eléments d' Economie Pure* is published with the joint support of the American Economic Association and the Royal Economic Society. With any other venerable classic this could hardly signify more than a long delayed gesture of well deserved historical respect. In the case of this amazing book such sponsorship can very well be interpreted as a suggestion that it be taken up and studied not as a chapter from the history of economic thought, but as a vital contribution to the present day discussion of the central problems of economic theory. Although first published eighty years ago, the *Eléments* still retains its intellectual power and analytical significance.

Those who have already read the book in French will find this English edition to be very helpful. Professor Jaffé not only presents us with a meticulous and sensitive translation of the fourth, so called definitive Edition published posthumously in 1926; in a carefully compiled "collation of Editions" he also describes (with numerous direct quotations in the original French) the changes which were successively introduced by Walras as the text went through the three earlier editions.

Walras did not use economics as a convenient vehicle to display his mathematical proficiency. He was a great economist (also incidentally the son of an economist) who after some years of search and hesitation squarely faced up, in his own words, to the "alternative either of steering clear of this discipline (the 'theory of determination of prices' W. L.), and consequently elaborating a theory of applied economics without recourse to a theory of pure economics, or of tackling the problem of pure economics without the necessary equipment, thus producing not only very bad pure economics, but also very bad mathematics." His mathematics are never elegant; they are markedly pedestrian and sometimes downright clumsy. Walras does not use determinants or vectors (among mathematical economists Irving Fisher was apparently the first to do so) but writes out his equations in full one after another—and occasionally he even loses his way among them.

Both the conscientious opponent of "mathematical economics," who might try to pay a furtive visit to the original source of that evil, and the aspiring theorist, wanting to apply his newly acquired knowledge of elementary calculus and algebra, will find little difficulty in following Walras' argument. And when the transition from one equation to another appears to be too abrupt, a properly placed footnote sign will refer the reader to the back of the book, where Professor Jaffé's lucidly written Translator's Notes fill out the gaps in the mathematical argument, follow up the implications of alternative interpretations and supply relevant bibliographical references.

Schumpeter in his *History of Economic Doctrine* rates Walras as the foremost economist of the nineteenth century, equal in stature to Adam Smith and superior to all the greats of the twentieth. If effective literary style, public influence, sound practical judgment and helpful advice on problems of current economic policies are to be taken into account, this would appear to be an obvious exaggeration. But if only the purely scientific performance is considered, i.e., the explicitly formulated contribution to the explanation (not criticism or suggestions for its possible improvement) of the object which we call the economic process—Walras' theory of general equilibrium might well be considered to be the greatest single contribution to economics.

Walras himself seems to have attached greater, or at least equal, significance to the law of diminishing marginal utility. His great preoccupation with the proper allocation of the priority credit for its "discovery" between himself, Gossen, Jevons and Karl Menger, proves this to be the case. So far as sheer novelty of the idea is concerned, it is true that the notion of general interdependence was inherent in the classical tradition to which he was heir, while the concept of measurable subjective utility clearly reflected the new psychologism which invaded all social sciences in the last third of the nineteenth century. But looking forward one observes that the idea of general equilibrium came to occupy a central, dominant role in modern economics, while the once so much discussed problem of value turns out to be one of its outlying, not to say peripheral, branches about to be sawed off entirely by the intrepid band of modern welfare theorists precariously perched on it very end-high above the ground of factual experience.

Unlike his view on marginal utility, Walras' theory of capital and particularly his elaborate theory of money are far from obsolete. As it has already been observed by others, Keynes unwittingly testifies to that by basing his own theory of money on the concept of "liquidity preference," a close replica of Walras' "desired cash balance."

It is customary to close the review of a translation with a list of suggested corrigenda or at least proposed changes in the interpretation and the choice of some words. I have none to offer. Professor Jaffé has carefully anticipated all criticism of this kind by reproducing often the original French expressions and suggesting, in the case of doubt, alternative translations.

*Harvard University* WASSILY LEONTIEF

*Value, Capital and Rent.* By Knut Wicksell. Translated by S. H. Frowein with a Foreward by Professor G. L. S. Shackle. New York: Rinehart and Co., 1954. Pp. 180. $3.50.

Here appears in English a translation of Wicksell's *Über Wert, Capital und Rente nach den neueren Nationalökonomischen Theorien*, which was originally published in 1893 and was reprinted in the L. S. E. Reprints of Scarce Tracts in 1933.

Wicksell's introduction comprises a very brief survey of the classical theory of value and a criticism of its illegitimate extension by the harmony economists and socialists.

He then devotes some forty pages to a symbolic statement of the "New Theory of Value"—that of Jevons, Walras, and the Austrian School. Wicksell's statement is clear and easy to follow and certainly marks that improvement over Jevon's generally attributed to it. He fulfills to a considerable degree his own admonition that "mathematical expression ought to facilitate the argument, clarify the results, and so guard against possible faults of reasoning—that is all" (p. 53). Thus, unlike the Austrians, Wicksell is not bogged down by any apparent difference in output attributable to the *removal* of a factor and the *addition* of a factor at the margin, a difference which disappears, of course, when the use of the calculus replaces discrete arithmetical examples.

In the final section Wicksell turns to the "New Theory of Capital" (Böhm-Bawerk's), an exposition which occupies about half the text. This flows quite naturally from his criticism of the failure by Walras to define capital appropriately and, in Wicksell's words, "to have completely overlooked the significance of time in production" (p. 95). He drops the ambiguous distinction made by Böhm-Bawerk between 'private' and 'social' capital and then resorts to the concept of the "stationary community." He resolves the problem here of a positive rate of interest by defining it as the means of subsistence of the capitalist. There follows a rigorous formulation of a theory of capital which is essentially a critical restatement of Böhm-Bawerk. Of this, in his *Production and Distribution Theories*, G. J. Stigler says: "The period of investment, like the period of production, cannot be defined unless one assumes that capital goods can be separated from other 'factors' (land and labor), and unless the latter work separately in capital creation. Wicksell never defends this crucial and, the writer is convinced, erroneous postulate of his system. As a result, the technical analysis . . . deserves high praise on the score of elegance, but it becomes primarily a display of technique" (p. 278).

If this be true, then only a belief in *ars artis gratia* could justify the appearance of the translation. But one cannot be absolutely sure of the criticism. In the *History of Economic Analysis* Schumpeter concludes of Böhm-Bawerk's ideas of capital that " . . . nothing is left of them except the essential idea. And this keeps on proving its vitality . . . " (p. 909). He asserts later that "a generation that has witnessed the Russian Five Year Plans should have little hesitation in placing at least limited confidence" in the argument that "a man may be prepared to pay a premium for present goods because command of present goods may enable him to embark upon physically more productive processes of production that require a *'longer' period of production* in Böhm-Bawerk's sense . . . " (p. 929, *italics supplied*). If this makes any sense at all (as it does to the reviewer), then *Value, Capital and Rent* must be a welcome addition to the library of milestones in theory that have not only elegance but some relevance to current problems as well.

Of considerable value is the bibliography of Wicksell's published works by Arne Amundsen, which is appended to the volume.

*Indiana University* ERSKINE MCKINLEY

*John Maynard Keynes: Economist and Policy Maker.* By Seymour E. Harris. New York: Charles Scribner's Sons, 1955. Pp. xiv, 234. $3.00.

The purpose of Scribners' *Twentieth Century Library*, of which the book under review forms a part, "is to give the intelligent layman a basic understanding of those thinkers of the last hundred years who have most influenced the intellectual currents of our time." Biographies of Darwin, Einstein, Veblen, and Dewey have already appeared, as well as others; and those of Whitehead, Marx and Nietzche are in preparation. Professor Harris' contribution to this library, on the life and writings of the late Lord Keynes, is therefore written with the layman in mind, rather than the professional economist, and its free flowing style, unincumbered by footnotes and minutiae, is designed for this purpose. While not intended as such, the book can perhaps serve as an alternative presentation, to the volumes by Hansen and Dillard, of Keynesian economics for an undergraduate course in macro economics. In this respect, the work of Professor Harris may be of added interest to the academician. For, while it has not been written with the idea of adding any new insights in Keynesian theory, the analysis contained in the volume may be quite adequate for such an undergraduate course.

Professor Harris' approach to Keynes the Man (Part I) and the general background of the ideas that influenced him (Part II) is mainly in terms of whether this environment was sympathetic to the development of the kind of economist and intellectual Professor Harris would like Keynes to have been, for " . . . his antidemocratic tendencies, his espousal of the apotheosis of the intellectual aristocracy, and his tendency to dissipate his energies" (p. 9)—all a direct result of Keynes' mixing with the *avant garde* Bloomsbury set—are aspects of the man that Harris scolds in a somewhat puritanical tone. Relying heavily upon Harrod's *Life of Keynes*, Harris discusses the influences which combined to develop the critical attitude, the dogmatic, egoistic approach to problems and the tremendous insights of one of the greatest minds of the first half of the century. That some of these influences, and some of their results, are undesirable from the American way of thinking, Harris is quite willing to admit. But these defects are of minor significance since Keynes' "mission in life was to save capitalism, not destroy it" (p. ix).

Since the book under review is directed at the intellectual layman, which, of course, includes a good number of business executives, one cannot but wonder whether Professor Harris' presentation will not convince many that Keynes' manner of saving capitalism discards the baby with the bath water. The conservative will be unconvinced because of the repeated attacks upon laissez faire and business-men in general, and the radical will disavow the criticism of economic planning and welfare capitalism. Remaining will be the middle of the road "liberal" who will agree with Keynes in eulogizing the "semi-independent corporation within the state, working for private profit but interested in the public good and yet 'detached from the wayward influence of politics'" (p. 73). Sceptics, at the same time, will but wonder whether such *naivete* is suggestive of a great mind!

Part III will be of major interest to the academic economist since it discusses the formal Keynesian model, or "the Significant Aspects of Keynesian Economics." It is this section which perhaps suffers the most from the author's need to cut an original MS of 85,000 words to 45,000. In 58 pages it is indeed difficult to present a discussion of the multiplier, consumption function, interest theory, the role of savings in a mature economy, the marginal efficiency of capital, the role of money and prices, and the influence of wage cuts on employment and output! At the same time, it is only with the knowledge of these economic variables that the layman will be able to understand and grasp the true significance of the Keynesian Revolution. Unfortunately, these concepts do not lend themselves to simple treatment, even though Professor Harris is undoubtedly a most adroit and capable person for such a task. If one is critical of the product, it should be remembered that this task is not an easy one.

Parts IV, V, and VI (Economic Fluctuations and Fiscal Policy, International Economics, and Keynes and the New Deal) all deal with Keynesian policy, and it is in this respect that the significance is most pronounced. However, there is apt to be a misrepresentation of whether Keynesian formulations preceded the economic holocaust of the 1930's. Harris leaves the impression that there was a uniformity of Keynesian thinking over time, as he does not give sufficient emphasis to the break with tradition that occurred in the writing of the *General Theory of Employment, Interest and Money*. Even though Harris concedes that in 1931 Keynes was claiming that England was suffering "from growing pains of youth, not from the rheumatics of old age," he considers this as a deviation "delivered in attempts to dispel gloom." A more appropriate interpretation would be that Keynes, too, had to learn from the economic situations that produced the *General Theory*.

In conclusion, one further comment regarding Harris' discussion of the influence of Keynes, and that concerns the repeated emphasis upon the "psychological" aspects of this influence. That is, the repeated emphasis given to the supposed ability of the single individual to shape and direct the major trends of economic and political history. This may be the fate of all biographies, but the same idea prevails in Harris' work that one found in Harrod's *Life of Keynes*; namely, that had Keynes worked a little harder, and had he been a little more willing to meet his opponents half way, he personally would have been able to accomplish a great deal more in terms of changing society's basic institutions. Certainly Harris does not err in this direction as much as Harrod, but the lack of emphasis upon the broader trends of world events during Keynes' lifetime is noticeable. Even great men must function in a society, and it is this which sets the limits of a man's influence rather than the day to day activities of leisure and work habits of the man.

*University of Pittsburgh* JOHN P. HENDERSON

*A General Theory of Economic Process*. By Neil W. Chamberlain. New York: Harper and Brothers, 1955. Pp. viii, 370. $5.00.

A well known labor economist here joins the list of those writers attempting

to fit economic analysis into a broader social theory. Like his ex-colleagues Dahl and Lindblom, Chamberlain is impressed by similarities between economic and political science. Unlike them, however, he is not primarily interested in the choice of techniques for rational social action, but rather in the choice of concepts and tools for effective social analysis. Moreover, the parallels between economics and politics are stressed only late in the book. The earlier sections owe much more to sociological and psychological writings than to analyses of political life.

The publisher's jacket describes the book as "a fresh approach to economics, based on the bargaining power and income flows of households, firms, and governmental units." In large part the fresh approach is a rewording; the author uses new phrases to ask old questions and reach familiar conclusions. This is not to deny the value of such of an accomplishment. As the heritage of Keynes' *General Theory* and various other economists' works has shown, a reformulation of old questions in new terms may excite readers' imaginations and lead them to push thought along lines hitherto ignored. It is too early to say what Chamberlain's uses of such concepts as bargaining power budget decisions, and aspirations will achieve. In the Preface the author modestly hopes that he "may stimulate others to follow lines of inquiry which are, in any event, already becoming quite evident in the literature."

One of the questions arising from a reading of the book is whether Chamberlain may not have made his key concepts of bargaining and bargaining power too inclusive. The former includes any actions which are directed towards influencing the terms of "cooperation" (broadly defined to include master-slave and legislator-voter as well as buyer-seller relationships). The latter is defined as "the capacity to effect an agreement on one's terms; operationally, one's bargaining power *is* another's inducement to agree" (p. 81). Such expanded terms seem to share both the strengths and weaknesses of the similarly expanded concepts of marginal cost and marginal revenue found in much recent literature. Their strength is that they enable conceptual integration; their weakness is that they do not provide specific clues.

A related point is that, although the definition of bargaining power offered above may look familiar, it is radically different from that implicit in much current usage. Writings on labor economics and the like ordinarily refer to wealth as a source of bargaining strength; it confers the power to wait and to bring pressure to bear on the opposing party. In Chamberlain's terminology wealth is a source of bargaining weakness. The "inducement to agree on another's terms increases with the amount of his assets, since the cost of agreement declines" (p. 120).

For many readers, talk of bargaining and bargaining power may bring to mind Galbraith's *American Capitalism*. For these, the present book's brief comparative comments on p. 154 will be of interest. Chamberlain remarks: "While agreeing with most of his argument, I would prefer to rest the case on concepts more basic than his 'countervailing power' . . . I prefer to keep the emphasis

simply on the constant and inescapable redistribution of bargaining power among the individuals in a society."

*Indiana University* HENRY M. OLIVER, JR.

*Competitive Economic Systems.* By George P. Adams, Jr. New York: Thomas Y. Crowell Co., 1955. Pp. vi, 516. $6.00.

In the event that someone might be misled, it is advisable to indicate that this book is intended as a text for a course in comparative economic systems. The author has substituted the term competitive for the more common term comparative, to indicate that the various systems are in competition in their quest for world dominance. The competitive aspect of this struggle runs through the author's discussion of capitalism, socialism, communism and fascism.

The book contains twenty-one chapters which have been classified into five parts. Part one, consisting of the first two chapters, includes a general comparison of economic systems and an analysis of the forces that bring about structural changes in an economic system. The author notes that different economic systems may serve different purposes such as: a military economy, a welfare economy, a prestige economy and a church economy. In spite of the differences in ends, production, distribution, and resource allocation remain paramount tasks.

Part II, chapters 3, 4, and 5, deals with capitalism and industrialism. The presentation here is theoretical and historical rather than statistical. Included are quotations from, and discussions of, the works of Adam Smith, J. M. Clark, Wilhelm Roephe, Lord Keynes, W. C. Mitchell, and others. The range of coverage is broad from a theoretical standpoint, encompassing discussions of laissez faire, business cycle theory, monetary theory, economic stagnation, the corporate form of business enterprise, price control, technological development, and the role of the state in economic activity. This section provides an excellent historical review of economic theory as it has developed in Western capitalistic societies. The author has made no attempt to trace the growth of physical production, income or living standards, nor does he emphasize the resource base necessary for the development of the modern industrial economies of the West.

The three chapters included in Part III are devoted to socialist and Marxian theory. A chapter on the theory of socialism is brief. Marxism is given two chapters. The author develops Marxian theory in a conventional manner but avoids the traditional Marxian analytical formulas.

German and Italian fascism, Russian communism and British socialism are covered in twelve chapters of Part IV. Fascist controls of prices, consumption, foreign trade, money, resources, labor, etc. are exceptionally well described. The Soviet and British economies are handled in a similar manner. The reviewer felt that Adams was at his best in the chapters on British socialism. Here he uses the tabular method to show trends through time. Similar tables would have strengthened his analysis of the fascist and Soviet economies. The reader is introduced to a minimum of Russian terminology but the section on German fascism seems

somewhat burdened with multi-lettered German terms. On the other hand, the section on Russia seems to be somewhat lacking in material drawn from specialized studies that have appeared since 1947.

Some of the author's conclusions (Part V) may be worth citing:

"... each system has demonstrated that it can work—at least as an economic system."

"Today, the differences among systems are not so much economic as they are social, political, and, in the last analysis, moral."

"While it may not seek to plan the economy, today's economy, nevertheless, is largely what government makes it. It does all this, and it cannot abdicate."

"The contemporary world is largely protectionist."

Following the concluding section is a short, but worthwhile bibliography, wherein the author has given a brief review of each book cited. Students should find the bibliography quite useful.

Some students may find the author's style somewhat lofty. Advanced students would probably find the book more useful if it contained questions and topics for further discussion and research.

*University of Kentucky* JOHN T. MASTEN

*Economics and the Public Interest.* Edited by Robert A. Solo. New Brunswick, New Jersey: Rutgers University Press, 1955. Pp. xiv, 318. $5.75.

This is a volume of some twenty essays written in honor of Eugene Ewald Agger, from 1926 to 1950 Chairman of the Department of Economics and Director of the Bureau of Economic and Business Research at Rutgers University, and, since 1950, Professor Emeritus at that institution. Professor Agger's long and distinguished career was marked by a consistent and continuous effort to translate the stuff of his science into practical terms and to take it out of the ivory tower and to put it to work in the everyday world. It is this characteristic of Professor Agger's own life that makes the title of this volume so meaningful and apposite.

The essays in this volume have been contributed by men now on the staff at Rutgers or who at some time have been associated with Professor Agger. A graceful and touching preface is contributed by Dr. Arthur F. Burns, Chairman of the Council of Economic Advisers, a former student of Professor Agger's.

The twenty essays are grouped into four Parts, the first Part dealing with the method and purpose of economics, the second with the role of economics in the empirical analysis of modern society, the third with certain problems of economic and social control, and the fourth Part with some problems of growth and development.

Like most similar symposia, this one suffers from the unavoidable unevenness of treatment inherent in such joint authorship and from the discontinuity of subject matter that shows through despite the effort made to hide it by the grouping of the essays.

In all cases, however, the essays are well done and provocative. The general reader will find much of interest in this volume although not all of the essays

will be equally appealing or intelligible to him. The professional economist will find in them much to stir up controversy, for they reflect very definite positions held by the authors with conviction and, sometimes, with emotion. On the whole, this volume is a commendable attribute to a very great man.

*Federal Reserve Bank of Atlanta* EARLE L. RAUBER

*A Theory of Economic-Demographic Development.* By Harvey Leibenstein. Princeton: Princeton University Press, 1954. Pp. xi, 204. $4.00.

This extremely interesting and comparatively new approach to the study of economic-demographic development is difficult to review critically and in detail. The author is concerned primarily with "the exploration of the conditions which are necessary in order to achieve a transition from" a Malthusian situation characterized by high natality and mortality and low average income to a non-Malthusian situation marked by low natality and fertility and high average income.

The nature and conditions of Malthusian equilibrium are described in Chapter 2. In Chapter 3, concerned with "displacements, statics, dynamics, and instability," the importance of knowledge of stability conditions for purposes of policy is stressed. A simple dynamic model is described in Chapter 4, and a basic difference equation is developed. The author finds that:

> There is some positive displacement from equilibrium average income which, if it were achieved, would permit the system to escape from Malthusian equilibrium. Similarly, if the initial increment in income is a monotonic increasing function of the injection of new capital into the economy [and if the average income gain multiplier is greater than the population multiplier], then there is an injection of new capital sufficiently large which, if obtainable, would enable the system to escape from Malthusian conditions.

Corollary propositions are indicated, among them, that minor displacements are impermanent.

In Chapter 5 destabilizers and stability conditions are further examined. Temporary fortuitous increases in average income are described as not likely to prove permanently destabilizing. Emigration is viewed as an unlikely though possible source of escape from Malthusian conditions. Innovations are considered more likely to produce permanent displacements. A series of capital injections, if properly distributed in time, may be less costly and more effective than a single large injection. Failures to achieve instability tend to increase the cost of its achievement at a later time.

In Chapter 6 the author considers effects attendant upon the introduction of modifications into his simple dynamic model. Since labor-elastic investment (i.e., investment which can absorb additional labor with relatively little sacrifice in average income) is to be preferred to labor-inelastic investment as a means to escape from Malthusian conditions, the conditions that tend to make investment labor-elastic are examined in detail. Circumstances affecting the efficiency of investment and the magnitude of the propensity to save are considered. The significance of changes in age composition is noted.

In Chapter 7 a multi-sector approach is substituted for the aggregative approach employed in earlier chapters. Possible bases for subdividing a population are considered, and it is noted that some sectors may be more sensitive than others to investment and other impacts. Price, income, and other channels whereby a change in one sector is communicated to another are identified. Various of these relationships are translated into terms of a multi-sector model; equilibrium and stability conditions are specified; and the effects of various combinations of population and investment shifts are contrasted. It is noted that under the new conditions many but not all the conclusions arrived at on the basis of earlier models continue to hold.

Micro-economic-demographic theories are considered in Chapter 8. The author's principal concern is the shape of the population growth function and the extent to which this shape is governed, by human values, by the occupational role structure of the population, by the investment and population alternatives open to its members, by the rules of selection governing the business of choosing from among the alternatives present, and possibly by other relevant circumstances. The initial and eventual response of mortality and fertility increases in average income are treated.

Chapter 9 has to do with optimum population theory. After considering single-criterion and multiple-criteria optimum theories under static conditions, the author examines the implications of modern welfare economics for optimum theory and concludes that one can say something about optimum theory only in the event that economic states can be ordered. Circumstances under which a preferred position can be selected are indicated. It is shown, furthermore, that only if the degrees of freedom exceed zero does it make sense to speak of optimum populations, but that determination of the optimum becomes more difficult as the degrees of freedom increase. He concludes that, under static conditions,

> The optimum concept is meaningful only from the point of view of what is achievable by public action or public choice. That is, a population size may be said to be optimum if there does not exist a collective act such that, interacting with the individual choices, there will result a different population size and economic state which is preferred to the existing economic state.

Under dynamic conditions "population paths" replace "population sizes" and "matrices" replace "points," but much of the analysis is similar to that employed under static conditions. The author concludes, however, that the scope and relevance of optimum population theory are quite limited at best. Escape from Malthusian conditions involves different problems and choices.

The concluding chapter includes, besides a summary of the book, observations concerning the possible contributions of empirical investigations. There is a bibliography. The lack of an index is offset by the completeness of the table of contents.

*Duke University* JOSEPH J. SPENGLER

*Economic Change in Thailand Since 1850*. By James C. Ingram. Stanford, Calif.: Stanford University Press, 1955. Pp. vii, 264. $5.00.

As holder of a Social Science Research Fellowship, Dr. Ingram spent the year 1951–52 in Thailand. He has made an exhaustive survey of materials bearing on the economic development of the country during the past century. Anyone familiar with the difficulties of digging for data in private and government offices where systematic record keeping is a rather recent innovation—if indeed it is practiced at all—will be impressed with the magnitude of the research undertaking.

In his preface, Dr. Ingram defines the primary purposes of his study. His task, he writes, is "first, to describe the major economic changes in Thailand since that country was exposed to the influence of world trade and Western culture in the middle of the nineteenth century, and second, to seek interpretations, explanations, and generalizations about that experience. . . . Much the greater part of the book is concerned with the first purpose." After a brief historical sketch and a careful reconstruction of the Thai economy in 1850, the author devotes two chapters to a discussion of the growth of rice exports and the role of government in the rice industry. Successive chapters are then given to a description of the three other major export products (rubber, tin and teak), to the study of imports and home-market industries, and to an analysis of the problems of currency and exchange. The three following chapters deal with sources of government revenue, with government expenditures, and with the development of an exchange economy. A final chapter, based solely on published reports available in this country, discusses recent developments—to 1954, to bring the information up to the publication date of the book.

Dr. Ingram has been most successful in achieving his first purpose. The lucid description of the historical changes of the Thai economy is based on a wealth of factual information previously available only in Thai language or in manuscript form, and thus inaccessible to interested scholars.

The presentation, on the whole, tends to be uncritical. The author seems reluctant to give clear expression to any conclusions which might be thought to find fault with any action of the present Thai administration.

This becomes especially apparent in the discussion of the position of the Chinese minority in the economic life of Thailand and in the treatment of the problem of the rice trade in the post-war period. One wonders whether, at the time this book was prepared for the press, it might not have been possible to anticipate the growing problem of accumulating stocks of unsalable rice surplus and to speculate on the long-range effects on the Thai economy of the short-sighted and greedy sales policy pursued by the Thai rice monopoly.

In these matters, as well as in some others, the author indicates rather than follows a number of paths along which research might profitably be done. Nevertheless, the publication of Dr. Ingram's findings represents a real contribution to a better understanding of the process of economic change in the only non-colonial country of Southeast Asia.

*Cornell University* FRANK J. MOORE

*Introduction to International Trade and Finance.* By Lorie Tarshis. New York: John Wiley and Sons, 1955. Pp. x, 536. $6.00.

This work, being offered as an undergraduate text, presents a very detailed and analytical approach to the treatment of international economics. Items of historical character are not shown in a chronological study. They tend rather to appear as examples of fact or theory.

After a general description of various problems involved in international economics, the author, in the first half of the book, attempts to show the place of national income as it affects imports and exports. He describes consumer response to national income changes. The foreign trade multiplier and its uses are also discussed. The impression seems to be created that a population is always bettered by an increased money income and vice-versa. Of course, if productivity does not keep pace with a national income increase, inflation tends to result. In consequence, welfare improvement does not necessarily follow.

Chapter seven is a good presentation of international trade methods. Next is an analysis of trade theory with a quite thorough picture of the principle of comparative advantage.

Several chapters follow that are devoted to capital and investment movements. Why persons are willing or unwilling to invest abroad does not rest always on theoretic logic or relative yields as the author seems to indicate. Nationalistic feelings are today being more and more expressed. Capital inflow is desired by many underdeveloped countries, but freedom of action by the foreign equity holder is too often restricted. For example, many countries, at present, allow only their nationals to hold majority equity in a business enterprise and limit profit transfers out of the country. Obviously this discourages outside private investment regardless of yield outlook.

In dealing with international capital movements, it is stated that a compensatory allowance should be made for risk differences in lending to various countries, since international income distribution is unsatisfactory. "If we find that some countries have too small a share of world income, while others have too large a share, the distribution of output amongst them will not maximize welfare, if they have to pay the same interests on their loans." To overcome this, it is suggested that an interest rate be granted such areas that will allow for too low a level of income. This appears to assume a willingness to work as well as initiative and know how, which, in fact, may not exist. If a people is sufficiently interested in getting ahead, subsidies or grants are not, as a rule, needed. Subsidies too often call for additional demands. The basic reasons why a country has never risen economically should be ascertained. If these cannot be corrected, there is likely to be little hope for betterment in spite of the suggested help.

The rest of the text is mainly devoted to a very expanded treatment of the balance of payment problems. However, the closing chapters describe in lucid fashion, domestic controls to achieve certain goals, mainly full employment; international conflicts of merchandise trading and capital movements that are at least partially being dealt with by agreements and organizations on an international basis; and finally a survey of the United States' position in world trade.

In brief, the book is a careful, but in places a bit repetitious, presentation of international trade theory. Though one may not agree with certain of his approaches to problems or to some conclusions drawn, the author's subject treatment most surely should stimulate thought. However, in view of the detailed nature of the writing and extended treatment given certain material, such as that covering balance of payments, some international trade instructors might consider using the book as additional reading rather than as a class text.

*Louisiana Polytechnic Institute* WILBUR T. MEEK

*Money, Banking, and the Financial System.* By Milton L. Stokes and Carl T. Arlt. New York: Ronald Press Co., 1955. Pp. iv, 670. $6.00

In the preface the authors express concern with the tendency of students to forget the "central theme of the subject, namely, the role of money and financial institutions in the determination and fluctuation of price and income levels." They go on to say that students need an explicit frame of reference to integrate the various aspects of a complex subject. These conjectures lead to a departure from the usual text: the presentation of monetary theory at the outset. To my knowledge only Chandler does something like this with an introductory chapter (2) on spending, output, and price levels. But then, Chandler reserves later chapters for the full treatment of theory, whereas Stokes and Arlt take care of all of it in Part I.

This position of the authors is logical. By starting with the "big picture" presumably one is better able to comprehend the lesser one. Nevertheless, I am inclined to doubt the value of this approach both on general pedagogical grounds and in terms of its specific employment in this text. My own teaching experience has demonstrated that it is more effective to start with the concrete and end with the abstract. The development of theory early in the course is too apt to pass by unnoticed—most students like to know *what* is being discussed before finding out *what it is all about.* This I submit, however, is a purely personal preference and in no way passes on the merit of the present text.

More pertinent is the treatment accorded by Stokes and Arlt to monetary theory, the explicit purpose of which is to keep the student from forgetting the "central theme of the subject" as he proceeds through the remainder of the course. Here (Part I) I fear there is nothing much that will stick beyond the ordinary. In fact, the theory is so condensed (only three chapters since the third chapter deals solely with the meaning and measurement of price level changes), on the one hand, and so smoothly presented, on the other, that there is neither the sustained analysis nor the obvious difficulty needed to make a lasting impress on the mind. Moreover, the theory is not put to work until much later on in the text.

These are pedagogical dissents and refer only to Part I. Aside from the brevity of that part, I have only two minor points to make regarding content. The discussion of money as a unit of account is ambiguous (p. 4). In particular, the statement that it is the fixity in price of the monetary unit that makes money generally acceptable as a medium of exchange and a store of value is open to

misinterpretation (p. 5). Again, in the analysis of the loanable funds theory it would seem more meaningful to put asset demand on the supply side rather than the demand side, although this alternative is mentioned in a footnote (pp. 77–78).

The rest of the text steers a course through the historical, institutional, and the economic. All of the customary subjects ranging from money markets through banking, policy, and international finance are carefully taken up. At the close of Part III (p. 184) the monetary equation is derived from the balance sheets of the Treasury, Federal Reserve System, and the commercial banks. However, this approach is not continued in the analysis of bank reserves (p. 255). The principles of commercial banking are not taken up until p. 195, and the essential matter of credit contraction and expansion not until p. 242. This will strike some instructors as a rather long wait. There is a fuller treatment of bank management than is usual, including a short section in chapter 11 on the procedure in organizing a new bank. Throughout there is reference to the Douglas and Patman subcommittees, part of a successful attempt to bring the subject matter up to date.

Despite my pedagogical reservations which, it is only fair to add, may be largely overcome through a simple rearrangement of chapters, I consider this a competent text. The authors obviously know what they are talking about and express themselves in a clear, steady prose. They have managed to put together a wide variety of useful information, within an analytical context, and the instructor is not likely to find any glaring, or even relatively minor, omissions. On the contrary, the text in its entirety is probably beyond the absorptive capacity of the average student (and the teaching capacity of the *good* instructor) in a one-semester course. Its coverage is well suited to a two-semester course.

*University of Maryland* FRANKLIN R. ROOT

*Short Term Economic Forecasting*. Studies in Income and Wealth Vol. 17. By the Conference on Research in Income and Wealth. A Report of the National Bureau of Economic Research. Princeton, N. J. Princeton University Press, 1955. Pp. xi, 506. $7.50.

Amateur forecasters on the "broccoli circuit" of businessmen's luncheon clubs will find no neat how-to-do-it formula laid out in this book. Alert non-specialists, however, should be able to profit from suggestions on how to evaluate survey material, and to serious students of business cycles, this is the stuff that adds meat to the bare bones of theory. Except for the first essay (a discussion and personal philosopy of forecasting methods by V. Lewis Bassie) the papers concern themselves with the techniques, analyses, and evaluation of anticipatory surveys of businessmen and consumers.

The paper by Friend and Bronfenbrenner on the OBE-SEC surveys of investment plans attempts to account for the reason why deviations of anticipated plans from actual expenditures ranged from −2 to +16 per cent in the years 1947 to 1952. The authors conclude that changes in sales and earnings outlook and in costs and availability of materials were the greatest culprits with some of

the error being associated with the cycle and therefore presumably only partially amenable to correction. Both U. S. and Canadian investment surveys, according to Firestone's paper on Canadian experience, show evidence of ability to forecast postwar downturns, but both tend to underestimate the volume of spending when an increase is expected and to overestimate when a decrease is expected.

Top-drawer businessmen, according to Modigliani, Sauerlender, and Marks, are tolerably accurate forecasters of certain variables affecting their own firms if asked to compare successive periods as in recent *Fortune* surveys, but lesser officials of large firms and executives of smaller firms are not so good if (and probably because) the comparisons are made with comparable periods of a year ago, as in the Dun and Bradstreet surveys or surveys of Railroad Shippers' Advisory Boards. On the other hand, Hultgren, after performing a postmortem on railroad shippers' quarterly forecasts since 1927, concludes that if the forecast is confined only to easily computed seasonal influences, the resulting estimate would be more accurate than those actually arrived at, which pretend to take into account future cyclical movements as well.

Unlike corporations which apparently only moderately confuse expectations and dreams, the consumer introduces a substantially different problem of economic forecasting by being caught between capricious plans and variable ability to afford his hopes. The paper by Lansing and Withey notes that although more people plan to buy homes and durable goods than do buy them during the year, the trend of "intending buyers" is worthy of note from year to year. Failure of spending units to carry out announced intentions is analyzed, with perhaps the most significant finding being that the coincidence of several factors affecting financial condition (i.e., high income, unexpected income increase and asset increase) is more important than any single measure or change in financial condition.

Schweiger, in the final paper, notes that consumers did not react to expected price and income changes in the manner anticipated by economists in the postwar period. He indicates, nevertheless, that by relatively sophisticated analysis of consumer buying intentions which check degree of certainty, financial ability, and general attitudes on the future, it is possible to forecast with reasonable accuracy the direction of changes in consumer purchases in a number of different components of durable goods and housing.

As usual the comments of discussants serve the twin functions of provoking thought and deflating somewhat the rosy view of the major contributors. Put together they seem to say that anticipatory survey experience has been limited to a rather unusual period of history that makes its record pretty good; anticipatory material is derived at one point in time whereas expectations are dynamic and should be treated as such; and finally the discussants generally are quick to pounce on evidence that the apparent discretionary process of decision making, which is what makes anticipation surveys necessary, is a process involving perhaps less free-will and more response to orthodox determinants of investment and consumption than the chief contributors would like to admit. All is in good fun, though, and the spirit of inquiry remains high. Bassie sums it

up best in his paper when he says: ". . .if we learn from our mistakes forecasting will be instrumental in developing the creative intelligence we need to deal effectively with the emerging future.

*Federal Reserve Bank of Atlanta* THOMAS R. ATKINSON

*The Attack on Big Business.* By J. D. Glover. Boston, Mass.: Division of Research, Graduate School of Business Administration, Harvard University, 1954. Pp. xvi, 375. $4.00.

If you don't like Big Business and are not quite sure why, worry no more. Professor J. D. Glover of the Harvard Graduate School of Business Administration has combed the literature and assembled all the reasons neatly classified and supported by citations long enough to catch the flavor of the attack.

The purpose of the book is to help businessmen formulate policies, reach decisions and take action calculated to meet the charges currently leveled at business.

Professor Glover's chapter headings admirably summarize the charges: "Big Business is Inefficient"; "Big Business is Monopolistic"; "Big Business Runs the Country"; "Big Business is Incompatible with the Economic Basis of Democracy"; "Big Business is Incompatible with the Social Bases of Democracy"; "Excessive Materialism"; "Irresponsible Individualism"; "The Baneful, Inhuman Civilization of Big Business."

This reviewer agrees with Professor Glover that the last three charges to the effect that private capitalism lacks moral and ethical validity are the most serious. It seems improbable that an economic system can flourish if public opinion regards it as unjust.

Throughout the book, but particularly in the last two chapters ("Critique of the Critics" and "Prescriptions for Action"), the author considers the charges which he has assembled with such care, and suggests what the businessman can and should do to change the climate of opinion. His defense is not as persuasive as the attack. Limitations of space are doubtless responsible for this over-all impression. It is to be hoped that Professor Glover will in time give us a companion volume *In Defense of Big Business.* He has shown that such a book is badly needed, and that he is admirably qualified to write it.

*Wabash College* JOHN V. VAN SICKLE

*The Union and the Coal Industry.* By Morton S. Baratz. New Haven, Conn.: Yale University Press, 1954. Pp. xiii, 170. $3.75.

Mr. Baratz remarks in his introduction that "much has been written about the bituminous coal industry in the past 30 years." He is so right. In spite of the volume of writing, much of it pretty definitely slanted in character, we have not had enough studies which seek to present all of the available facts and then to subject them to a dispassionate analysis. The author is probably also correct in his statement that "there has been no study of the nature of the union's role." The objective character of the book and the careful probing for answers to "questions of significance to the study of the entire labor movement" make it

possible to say that it represents a solid contribution to the field of labor economics.

The first three chapters of the book are definitely background in character. The material is basic to the understanding of the analysis which follows. It is presented in a concise but complete form which is a very useful refresher, even for those familiar with the industry.

Chapters 4 and 5, which deal specifically with union policies and the political side of the relations between the union and the operators, may also be said to be background. The material, however, is probably less well-known to more people than that contained in the earlier chapters. The reader will get a very clear picture of just what the objectives of the union are and the reasons it has adopted them. The "power consciousness" of the miners' union, both in its relations with the operators as well as with the government, will certainly be understood even by those who are not in agreement with it.

The final four chapters present the meat in the coconut. What have been the effects of union policies and strategies on wages, competitive relationships, resource allocation and public policy? These are the sort of significant questions which Mr. Baratz started out to answer. He dodges none of them. In the process he preserves his objective attitude and avoids sitting in judgment as to the goodness or badness of the effects found. His conclusions are well-reasoned and are based upon a large amount of well-documented material. They fall into three rough groups. Where the evidence is clear he states a definite effect. In other cases he indicates possible effects not conclusively proven. Finally, there are some questions for which he finds that the answers are not determinable.

It may be quite true, as Mr. Baratz suggests, that his conclusions will not meet with universal acceptance. That is not a matter of great importance. The real value of his work lies in his careful analysis and his successful attempt to bring together in one study all of the aspects of the impact of the union in the coal industry. Those who do not agree with some of his conclusions will find his work a challenge to their own ability to sustain their views.

The books of many economists are limited in their appeal because they are written in terms of fine spun theory which are most difficult for readers not well versed in economic theory to understand. Mr. Baratz for the most part has not so restricted his reader potential. With the exception of a few pages in the first chapter which may give pause to those not acquainted with Mr. Keynes, the book is so clearly written that a wide range of readers should find it both extremely interesting and understandable. At the same time the economic theorists will find little with which to quarrel in Mr. Baratz's use of theory. There is some repetition of material in Chapter 3 which was presented in the previous chapter. The fault is not serious, but is noticeable. The study merits designation as a scholarly work with special praise for being readable as well. Studies of similar character and quality in others of our important industries would be most valuable additions to our knowledge of labor economics.

*University of Alabama* BURTON R. MORLEY

*Commuting Patterns of Industrial Workers: A Study of Experience Since 1940 in the Northeast Region.* By Leonard P. Adams and Thomas W. Mackesey. Ithaca, New York: Housing Research Center, Cornell University, 1955. Pp. iv, 135. Paper, $2.00.

This study was sponsored by the Housing Research Center at Cornell University. It was initiated as an attempt to gain understanding of housing needs in communities receiving defense contracts. The underlying idea was that such a study could ". . .be expected to provide significant clues to the importance of commuting as a means of solving labor supply problems, to changes in commuting patterns that take place under emergency conditions, and to the factors that determine geographic and other limits of commuting patterns."

Three types of data sources are presented, summarized, and analyzed. World War II studies were examined with the aim of throwing light upon the question, What is a reasonable commuting distance under wartime conditions? The data showed considerable variability among areas and among plants within the same area; generally, two-thirds to three-fourths of workers lived within ten or fifteen miles of their place of employment and about 90 per cent lived within twenty miles. Next, the authors examined a series of post-World War II studies for purposes of comparison with the wartime data. Distances appeared to be roughly the same, as was the extent of variation in plant and geographic patterns. Finally, three new studies were made (in 1951) of quite different areas in New York state; these were undertaken for the purposes of checking information gleaned from the earlier studies, explaining the variability of journey-to-work patterns, and experimenting with methods of gathering commuting data. These data suggest a diminution in long-distance commuting (twenty-five miles and over) and a slight increase in medium-distance commuting (between ten and twenty-five miles)—but these changes aren't clear-cut. What does appear to be certain is that commuting, primarily by means of private automobile, is a prominent characteristic of the current labor market scene, and that distances greater than twenty miles (often, considerably greater) are not excessive.

The study emphasizes that labor supply, housing, and transportation facilities must be thought of as intimately related problems in local labor market analysis. In this connection, I was disappointed that there was no mention throughout the study of rent controls as a complicating influence. When the available stock of units is effectively frozen in the hands of present tenants by rents fixed at less than free-market levels, housing supply problems are different from those encountered when the price mechanism is doing the rationing. Similarly, we should expect labor-supply and commuting-distance data to be affected by whether or not workers outside any urban area can compete for living quarters near the area's employers.

Nevertheless, the authors of this publication have done labor market analysts a great service in bringing together these data, in commenting upon their implications for the establishment of local labor market boundaries, and in providing extensive suggestions with respect to methodology.

*University of North Carolina* ROBERT L. BUNTING

*Personnel Relations.* By Arthur M. Whitehill, Jr. New York: McGraw-Hill Book Co., 1955. Pp. xi, 526. $6.00.

Professor Whitehill's book is an addition to the rapidly growing list of books to appear since World War II on the subject of Personnel Relations. While the book contains little that is new in content and organization, it does contain some excellent writing. As an introductory text, the material is presented in such a manner that problems and practices in the field of personnel relations can be easily understood by beginning students.

The book is divided into five parts. Part I is devoted largely to background material. Part II describes the various programs and procedures that are used for the purpose of matching men and jobs. This part covers such important procedures as recruitment and selection of workers, testing and rating programs to evaluate employees, changes in employment and status, and training and education. Part III deals with the more technical aspects of personnel management such as work schedules, wage plans, communications, safety and health programs, nonwage benefits and services. Part IV attempts a brief evaluation of the present status of trade unions. In the last part the author summarizes the weaknesses of our present day personnel policies and offers ways and means whereby these policies may be improved upon in the future.

The book is suitable for use in one-quarter courses in Personnel Relations and for other short courses in the subject. If used in one-semester courses the teacher will find it necessary to supplement the book by assigning problems and other materials.

The reviewer feels that Professor Whitehill's book contains the core material for an excellent text on the entire field of Personnel Relations. The author himself is fully aware of the shortcomings of his first attempt at writing a text. In the Preface he states, "It should be emphasized, however, that this core material is merely a point of departure for further exploration."

*University of Virginia* GEORGE T. STARNES

# NOTES

## PROGRAM OF THE TWENTY-FIFTH ANNUAL CONFERENCE OF THE SOUTHERN ECONOMIC ASSOCIATION

*Biltmore Hotel, Atlanta, Georgia, November 11 & 12, 1955*

*Friday, November 11, 1955*

9:00 A.M.—Meeting of the Executive Committee

10:00 A.M.—Morning Sessions

Seminar A: Foreign Trade Policy and International Payments. Chairman: George E. Hunsberger, University of Arkansas.

1. Capital Imports and the Balance of Payments. James C. Ingram, University of North Carolina. Discussion: R. W. Trenton, Oklahoma A. and M. College.
2. A Foreign Trade Policy for the United States. Don D. Humphrey, Duke University. Discussion: Rector R. Hardin, Howard College.
3. Domestic Agricultural Policy and the International Economy: The Case of Cotton. Royall Brandis, University of Illinois. Discussion: W. Hubert Baughn, Louisiana State University.

Seminar B: Financing Highways, Schools and other Governmental Services in the Southeast. Chairman: Charles P. White, University of Tennessee.

1. A Review of State and Local Finances and Fiscal Problems. Hershal L. Macon, Tennessee Valley Authority. Discussion: Clement H. Donovan, University of Florida.
2. Some Problems of Highway Financing in the Southeast. Charles R. Lockyer and James W. Martin, University of Kentucky. Discussion: Robert T. Collins, Alabama Polytechnic Institute.
3. Centralization of Government Expenditures for Education and Highways in North Carolina. C. E. Ratliff, Jr., Davidson College. Discussion: Stuart A. MacCorkle, University of Texas.

Seminar C: Conservation of Economic Resources: Oil, Gas and Water. Chairman: Fred H. Arnold, Alabama Polytechnic Institute.

1. The Political Economy of Petroleum Conservation. Eugene L. Swearingen, Oklahoma A. and M. College. Discussion: Olin T. Mouzon, University of North Carolina.
2. Recent Developments in Federal Control of Natural Gas. B. B. Holder, Washington and Lee University. Discussion: Merwyn G. Bridenstine, University of Arkansas.
3. The Economics of Water Resource Conservation. Jerome W. Milliman, Florida State University. Discussion: W. K. McPherson, University of Florida.

Seminar D: The Determination and Evaluation of Market Areas. Chairman: Harry A. Mitchell, Tulane University.

1. Market Potentials and the Changing Market Structure of Florida and Southern Georgia. Edgar S. Dunn, Jr., University of Florida. Discussion: John L. Fulmer, Emory University.
2. Factors Influencing the Size of the Labor Market Area for Manufacturing Firms. James H. Thompson, University of West Virginia. Discussion: John L. Johnson, University of Kentucky.
3. Economic Considerations in Locating Suburban Shopping Centers. Reinhold P. Wolff, University of Miami. Discussion: John R. Craf, University of Louisville.

2:00 P.M.—Afternoon Sessions

Seminar A: Cases in Economic Analysis and Measurements: Cotton, Cattle and Eggs. Chairman: Montgomery D. Anderson, University of Florida.

1. A Random-Shock Model of the Cotton Textile Industry. R. W. Pfouts and Thomas M. Stanback, Jr., University of North Carolina. Discussion: John S. Henderson, University of Alabama.
2. The Cyclical Behavior of Cattle Numbers and Prices. Hugh E. Law, Louisiana State University. Discussion: Ervin K. Zingler, University of Houston.
3. Factors Affecting the Short-Time Changes in the Price of Eggs. Allen T. Barr, University of Mississippi. Discussion: Homer H. Hamner, Baylor University.

Seminar B: Current Problems in American Transportation with Suggested Solutions. Chairman: Milton S. Heath, University of North Carolina.

1. An Economic Analysis of Piggyback Transportation. Harold L. Johnson, the State College of Business Administration, Atlanta, Georgia. Discussion: H. H. Mitchell, Alabama Polytechnic Institute.
2. The Railroad Passenger Deficit. Carl Stern, Randolph-Macon Woman's Col-

lege. Discussion: Marcus Whitman, University of Alabama.
3. The Transportation Company: A Solution to Interagency Competition and Conflicting Transport Regulation. Lee J. Melton, Jr., University of Florida. Discussion: Clarence E. Kuhlman, University of Tennessee.

Seminar C: The Industrialization of Southern Regions, and the South. Chairman: James E. Gates, University of Georgia.
1. Economic Development of the South Carolina-Georgia Piedmont. Anthony M. Tang, Vanderbilt University. Discussion: William H. Nicholls, Vanderbilt University.
2. Mississippi's Balance Agriculture with Industry Program. W. M. Caskey, Mississippi College. Discussion: William T. Hicks, University of Mississippi.
3. Can the South Become Over-Industrialized? John W. Chisholm, Louisiana State University. Discussion: Joseph J. Spengler, Duke University.

Seminar D: Monetary Policy, Agricultural Credit, and investment decisions. Chairman: James B. Trant, Louisiana State University.
1. Monetary Policy in the First Half of 1953. Warren L. Smith, University of Virginia. Discussion: Aurelius Morgner, A. and M. College of Texas.
2. Credit, Capital Rationing and the Accelerated Development of Southern Agriculture. Quentin W. Lindsey, North Carolina State College. Discussion: Frank C. Tibbetts, The Citadel.
3. Portfolio Selection under Conditions of Uncertainty. H. A. Latané, University of North Carolina. Discussion: Grover A. J. Noetzel, University of Miami.

Seminar E: Merchandising and Market Research. Chairman: Karl D. Reyer, Louisiana State University.
1. Merchandising Aspects of Consumer Installment Selling. W. D. Robbins, Rollins College. Discussion: Ralph C. Heath, Wake Forest College.
2. The Development of Multiple-Unit Large Department Store Investment-Management Systems. Harry A. Lipson, University of Alabama. Discussion: Karl Morrison, University of Mississippi.
3. Survey of Research in Business. Charles Thomason, Jackson Brewing Company, New Orleans. Discussion: J. W. Reddoch, Louisiana State University.
4. Round-Table Discussion. Advertising: Royal H. Ray, Florida State University. Salesmanship: C. A. Kirkpatrick, University of North Carolina. Sales Management: R. O. Moen, North Carolina State College. Tourism: Thomas J. Luck, College of William and Mary.

5:00 P.M.—Meeting of members interested in organizing a southeastern regional business law association, called by Wesley C. Harter and Dwayne Oglesby, President and Vice President, respectively, of the Southern Regional Business Law Association.

6:00 P.M.—Dinner Meeting of the Officers of the Southern Economic Association, and Editors and Correspondents of the Southern Economic Journal.

8:00 P.M.—Evening Session

Chairman: David McCord Wright, McGill University.
Presidential Address: The Economic Stagnation Thesis, Once More. Ernst W. Swanson, Emory University.

*Saturday, November 12, 1955*

9:00 A.M.—Business Meeting

Chairman: Ernst W. Swanson, President, Southern Economic Association.

10:00 A.M.—Morning Sessions

Seminar A: The Tools of Economic Analysis in Business Management. Chairman: Tipton R. Snavely, University of Virginia.
1. Evaluation of Cost Determining Variables by Economists and Managers. Walter Kennon, Emory University. Discussion: R. Murray Havens, University of Alabama.
2. The Discipline of Economics and the Discipline of Business. Clarence E. Philbrook, University of North Carolina. Discussion: Robert S. Smith, Duke University.
3. Tools Which Do Not Fit. W. R. Knight, The State College of Business Administration, Atlanta, Georgia. Discussion: Rodman Sullivan, University of Kentucky.

Seminar B: Comparative Economic Development of Foreign and Southern Areas. Chairman: Gerald E. Warren, Tulane University.
1. The Race for Industry—A Comparison of the Soviet Experience with the Southeast. The Southeastern Version. Robert W. Patterson, University of South Carolina. The Soviet Version. James H. Blackman, University of South Carolina.
2. Divergent Sectional Developments in Italy and the United States. Lloyd Saville, Duke University. Discussion: Harry Starke, University of Miami.
3. International Developments in a "Mixed Economy": India. C. Addison

Hickman, North Carolina State College. Discussion: Paul W. Paustian, University of Alabama.

Seminar C: A Re-Examination of Protective Labor Legislation. Chairman: Frank T. de Vyver, Duke University.

1. The Fair Labor Standards Act Reviewed in the Light of the Employment Act. John V. Van Sickle, Wabash College. Discussion: Charles P. Anson, Alabama Polytechnic Institute.
2. Protective Labor Legislation and Its Administration in Tennessee. J. Fred Holly, University of Tennessee. Discussion: John M. Peterson, Tennessee Valley Authority.
3. Some Recent Developments in Unemployment Insurance. Carey C. Thompson, University of Texas. Discussion: Burton R. Morley, University of Alabama.

Seminar D: Problems in the Economics of Agriculture. Chairman: R. J. Saville, Mississippi State College.

1. Recent Trends in Southeastern Farming and Forestry. Gregor Sebba, University of Georgia. Discussion: B. W. Harris, Alcorn A. and M. College.
2. Aspects of Financing the Productive Use of Resources on Part-Time Farms in the Southeast. Arthur H. Kantner, Federal Reserve Bank of Atlanta. Discussion: Jesse W. Markham, Princeton University.
3. The Place of Farmer Cooperatives in the Nation's Economy. Martin A. Abrahemsen, Farmer Cooperative Service, U. S. Department of Agriculture. Discussion: Maurice J. Danner, Alabama Polytechnic Institute.

12:00 Noon—Meeting of the Joint Executive Committee

## DEATH

George T. Starnes, professor of labor economics at the University of Virginia since 1925, died on July 6, 1955.

## APPOINTMENTS AND RESIGNATIONS

Charles Cortez Abbott has been appointed professor of banking and finance in the Graduate School of Business Administration, University of Virginia.

Sister Agnes, O. P., has been appointed instructor in economics at Siena College, Memphis, Tennessee.

J. S. Almeida has been appointed instructor in accounting at the University of Florida.

C. P. Anson, of Alabama Polytechnic Institute, participated in a conference of the National Manpower Council held in Asheville, North Carolina, July 19 and 20.

Wilson T. Ashby, associate professor of office administration and business administration at the University of Mississippi, spent the summer as an observer and consultant on office management at the home office of the Illinois Central Railroad.

George H. Aull has been re-named for a second year to membership on the Economic Policy Committee of the U. S. Chamber of Commerce.

Stephen J. Barres, formerly of Purdue University, has accepted an appointment to the staff of the Department of Economics and Business Administration at Texas Western College.

Frederick Basco has been promoted to assistant professor of business education at Arkansas State Teachers College.

Joyce Bateman has joined the staff at Wake Forest College as instructor in secretarial studies.

Winston Beard, instructor in business administration last year, has been appointed assistant business manager of Ouachita College.

John R. Beishline, recently retired brigadier general of the U. S. Army, has been named professor of management in the College of Business Administration, University of Texas.

Gordon Bell, of Duke University, was visiting assistant professor of accounting, University of Florida, during the Summer, 1955.

Lawrence J. Benninger has been appointed associate professor of accounting at the University of Alabama.

Homer Black, assistant professor at the College of Business Administration, University of Georgia, taught in the Executive Development Program at the Massachusetts Institute of Technology during the summer of 1955.

Robert P. Black has left the Federal Reserve Bank of Richmond and accepted an assistant professorship at the University of Tennessee.

Robert O. Boston has been reappointed instructor in the Department of Economics and Business Administration at Alabama Polytechnic Institute after serving in the Navy.

Elbert V. Bowden has been appointed instructor in the Department of Economics and Business Administration at Duke University.

Julian H. Bradsher, assistant professor of economics at Oklahoma A. and M. College, has been granted a sabbatical leave for the first semester, 1955–1956, to continue work on his doctoral dissertation at the University of California.

Jess W. Brandon has been promoted to associate professor in the Department of Accounting, School of Business Administration, University of Miami.

Robert E. Branson, formerly of the Agricultural Marketing Service of the U. S. Department of Agriculture, has been appointed associate professor of agricultural economics at Texas A. and M. College.

Frederick A. Brett has been appointed assistant professor of accounting and business administration at Alabama Polytechnic Institute.

Maurice R. Brewster has been appointed director of the School of Industrial Management, Georgia Institute of Technology.

James M. Buchanan, chairman of the Department of Economics, Florida State University, is on leave during the academic year 1955–56 while studying on a Fulbright research grant in Italy.

Thomas A. Burch has been appointed assistant agricultural economist in research at Clemson College.

J. D. Butterworth, formerly with Indiana University, has been appointed associate professor of marketing, University of Florida.

Doyle L. Calton has resigned his position in the School of Business, Baylor University, to enter private business.

John E. Champion has been promoted to associate professor at the College of Business Administration, University of Georgia.

C. A. Christophe has been appointed instructor of business at the Agricultural, Mechanical and Normal College (Arkansas).

Sherrill Cleland has been appointed assistant professor of economics at the University of Richmond School of Business Administration for the session 1955–56.

R. S. Cline, formerly with Atlanta Division, University of Georgia, has been appointed associate professor of insurance, University of Florida.

J. Van B. Coe is an associate professor of economics and sociology at Tennessee Wesleyan College.

Almand R. Coleman has been appointed professor of accounting in the Graduate School of Business Administration, University of Virginia.

Frank G. Coolsen, of the University of Kentucky, has been granted leave for 1955–56 to do graduate work at the University of Illinois.

Dale E. Cramer, formerly of Louisiana State University, has accepted a position as assistant professor of economics at Texas Western College.

Firman Cunningham, who has been serving as part-time instructor in economics at Middle Tennessee State College while doing graduate work at Vanderbilt University, was appointed full-time instructor in economics.

Guy L. Darnell has resigned from the Department of Business and Economics of the Agricultural, Mechanical and Normal College (Arkansas).

Maurice Davier has been appointed professor of business administration in the Graduate School of Business Administration, University of Virginia.

David P. Delorme, who has been teaching at Idaho State College, has joined the staff of the Department of Economics and Business Administration at Texas Western College.

H. E. Dennison retired as director of the School of Industrial Management, Georgia Institute of Technology, on June 30, 1955. He was associated with Georgia Tech for more than thirty years, and was director since 1938.

C. T. Devine, formerly with University of Southern California, has been appointed visiting professor of accounting, University of Florida, for the year 1955–56.

Alvin Dickinson has been appointed head of the Department of Business Education at the University of Arkansas.

William P. Dillingham, of Florida State University, served as a consultant to the Presidential Commission on Veterans Affairs during the summer of 1955 in Washington, D. C.

H. M. Douty, chief of the Division of Wages and Industrial Relations, Bureau of Labor Statistics, U. S. Department of Labor, is the recipient of a Rockefeller Public Service Award. He is spending a year abroad, principally at the London School of Economics, in research into problems of wage determination and employment.

Clive F. Dunham, dean of the College of Commerce and Business Administration at the University of Mississippi, attended the 1955 Middle Management Institute sponsored by the Ford Foundation at the Harvard Graduate School of Business Administration.

Clarence Dunn has been promoted to associate professor of accounting at Louisiana State University.

E. S. Dunn, Jr., has been promoted to associate professor of economics, University of Florida.

William H. Durham, Jr., has been granted a leave of absence from Wake Forest College to pursue further study.

James H. Edmondson, after a year's leave studying at Indiana University, has resumed his position as chairman of the Division of Business Administration of Ouachita College.

Charles Edward Edwards has been appointed part-time instructor in business administration at the University of North Carolina.

Corwin D. Edwards, who served as visiting professor of economics at the University of Virginia during the past session, has accepted a professorship in the School of Business at the University of Chicago.

C. W. Ehlers has resigned as assistant professor of marketing, University of Florida, to join the staff of the Atlanta Division, University of Georgia.

Carson Evans, formerly assistant agricultural economist at Clemson College, has taken a job with the Production Credit Association at Barnwell, S. C.

David McKenzie Faulkner has been appointed part-time instructor in business administration at the University of North Carolina.

Rashi Fein, lecturer in economics at the University of North Carolina, taught in the Department of Economics at The Johns Hopkins University during the summer of 1955.

P. E. Fenlon has resigned as instructor of economics, University of Florida, to accept an appointment as assistant professor of economics, College of the Holy Cross, Worcester, Massachusetts.

Clinton S. Ferguson has been promoted to associate professor of economics at East Tennessee State College.

John Douglas Forbes has been appointed professor of business history and secretary of the faculty in the Graduate School of Business Administration, University of Virginia.

E. Elwood Ford has been appointed associate professor of accounting at the University of Richmond School of Business Administration for the session 1955–56.

Robert A. Ford has been appointed instructor in the Department of Finance at the University of Alabama.

Carl E. Frisby has joined the staff of the Department of Economics and Business Administration at Alabama Polytechnic Institute as instructor in economics.

C. W. Fristoe has been promoted to associate professor of economics, University of Florida.

Robert L. Froemke has resigned as assistant professor at the College of Business Administration, University of Georgia, to accept a position in New York City with the Standard Oil Company of New Jersey.

James E. Gates, dean of the College of Business Administration, University of Georgia, served as consultant to the U. S. Bureau of the Budget during the period April–June, 1955, on duty with the Division of Statistical Standards.

Claude S. George, Jr., associate professor of industrial management at the University of North Carolina, was one of 37 educators in the country invited to participate in the Ford Educational Forum at Dearborn, Michigan in July. In August he spent three weeks with the Methods Engineering Council in Pittsburgh studying Methods-Time Measurement.

Irving J. Goffman has been appointed assistant instructor at Duke University in the Department of Economics and Business Administration.

Marvin Goodstein has left Cornell University and has joined the staff of the University of the South as assistant professor of economics and business administration.

William E. Green, formerly assistant professor of business administration at the University of Omaha, has accepted a position as professor of industrial management at the University of Mississippi.

James V. Griffin has resigned as assistant professor in industrial management at Georgia Institute of Technology to accept a position with Lockheed Aircraft Corporation.

Warren J. Gustus has resigned as instructor in the Department of Economics and Business Administration at Duke University.

Douglas Hartle has resigned as instructor in the Department of Economics and Business Administration at Duke University.

Robert D. Haun, of the University of Kentucky, is visiting professor of accounting at the School of Business Administration, University of Michigan, 1955–56.

R. M. Havens, of the University of Alabama, attended the Du Pont Educators Conference held at Wilmington, Delaware, June 20 to 30.

L. T. Hawley, of the University of Alabama, attended the eighth Jersey Roundtable held by the Standard Oil Company of New Jersey from June 15 through June 17.

Robert D. Hay has been promoted to associate professor of management at the University of Arkansas.

Rolf Hayn has been appointed assistant professor of economics at the University of Oklahoma.

Harold J. Heck, professor of business administration at Tulane University, was employed during the summer months by the United States Department of Commerce, Washington, D. C.

William Ross Heck has been appointed instructor in accounting in the Department of Economics and Business Administration at Alabama Polytechnic Institute.

Lucille Hellman has been appointed instructor in the Department of Business Law, School of Business Administration, University of Miami.

William Heuson has been promoted to associate professor in the Finance Department at the University of Miami School of Business Administration.

R. J. Hildreth, formerly of Iowa State College, has been appointed assistant professor of agricultural economics at Texas A. and M. College.

J. E. Hipp has been appointed instructor in the Department of Business Organization and Operation, University of Florida.

W. M. Howard, formerly on the staff of American College of Life Underwriters, has been appointed associate professor of insurance, University of Florida.

Patrick Huntley, formerly at the University of North Carolina, has been appointed instructor in the Department of Economics and Business Administration at Duke University.

Forrest Hyde has been appointed lecturer in business administration in the Graduate School of Business Administration, University of Virginia.

James C. Ingram, assistant professor of economics at the University of North Carolina, spent the summer at the Mathematics Institute, sponsored by the Social Science Research Council, at Stanford University.

Lee R. Johnston has been appointed assistant professor of business administration in the Graduate School of Business Administration, University of Virginia.

Matthew H. Jonas, who has been doing graduate work at the University of California, has been named instructor in economics at the University of Texas.

Barclay G. Jones has been reappointed teaching fellow in economics at the University of North Carolina.

Mary F. Kangley has received an appointment as Julian Price fellow in life insurance at the University of North Carolina.

Frank S. Kaulback, Jr., has been appointed director of the McIntire School of Business and Commerce of the University of Virginia.

Samuel T. Keim, formerly at Texas A. and M. College, has been named chairman of the Department of Business Administration at Kansas State College.

Tom A. Kelly was appointed associate director of the Business Research Station at Mississippi State College, effective July 1.

Dave M. Kerley has been promoted to associate professor of economics at Winthrop College.

Eloise Kimmelman has been promoted to associate professor in the Department of Accounting, School of Business Administration, University of Miami.

Randolph G. Kinabrew, associate professor of economics at the University of Mississippi, has resumed his duties after studying at Harvard University during the 1954–55 school year under a grant from the Fund for the Advancement of Education.

Martin King, graduate assistant in marketing at Ohio State University, is visiting professor of business administration at the University of Kentucky during 1955–56.

Roy A. Klages, assistant professor of business administration at Mississippi State College, has been granted a leave for further graduate study at the University of St. Louis.

John B. Koch, formerly part-time instructor in economics at the University of Arkansas, has been appointed assistant professor of economics and business at Arkansas State Teachers College.

Juanita M. Kreps has been appointed instructor in the Department of Economics and Business Administration at Duke University.

John M. Kuhlman has left the University of Richmond to join the economics faculty of the University of Cincinnati for the session 1955–56.

R. L. Lassiter, Jr., has been appointed interim instructor in economics, University of Florida.

Marlin V. Law has been appointed instructor in industrial management in the School of Industrial Management, Georgia Institute of Technology.

Robert G. Layer, formerly at Texas A. and M. College, has accepted an ap-

pointment as acting chairman of the Department of Economics, Southern Illinois University.

James Lemly, assistant professor at the College of Business Administration, University of Georgia, has accepted an appointment at the Atlanta Division, University of Georgia.

Ernest Lent joined the Department of Economics, Randolph-Macon Woman's College, this fall as instructor in economics.

Irving O. Linger, formerly of the University of Arizona, has been named assistant professor of finance, College of Business Administration, University of Texas.

Justin G. Longenecker has joined the faculty of Baylor University as associate professor of management in the School of Business.

Edward S. Lynn has resigned from the University of Texas to join the staff at the University of Tennessee as associate professor of accounting.

Robert A. Lynn has been appointed instructor in economics and business administration at Maryville College.

R. M. Lyon has resigned as assistant professor of industrial relations and management, University of Florida.

John J. MacAllister resigned as associate director of the Business Research Station and head of the Department of Institutional and Industrial Management at Mississippi State College effective July 1 to accept a position in hotel management at Oklahoma A. & M. College.

R. C. McAllister, formerly with the University of Washington, has been appointed instructor in accounting, University of Florida.

Donald J. McClurg, who has been doing graduate work at the University of California, has been named instructor in economics at the University of Texas.

Phillip McCoury has left Duke University and has been appointed assistant professor of economics at the University of Tennessee.

B. C. McGough has been appointed interim instructor in real estate at the University of Florida.

L. W. McKenzie, associate professor of economics at Duke University, will spend the spring semester of 1956 as a guest of the Cowles Foundation.

T. Harry McKinney received the Ph.D. degree from the University of Oklahoma in May and has been appointed assistant professor of accounting at that institution.

M. T. McNab has resigned as instructor in accounting, University of Florida, to enter public accounting practice in Florida.

John P. Maggard, Jr., has left the University of North Carolina and has been appointed assistant professor of marketing at the University of Tennessee.

Everett J. Mann has resigned as associate professor of accounting at Duke University.

Charles Marberry has been promoted to associate professor of economics at the University of Arkansas.

F. Ray Marshall, associate professor of economics at the University of Mis-

sissippi, has been granted a leave of absence for the 1955–56 school year to accept a Fulbright grant to do research on the Finnish Labor Force at the University of Helsinki.

C. A. Matthews has been promoted to professor of finance, University of Florida.

George M. Maverick has been appointed visiting professor of business administration in the Graduate School of Business Administration, University of Virginia.

Everard W. Meade has been appointed lecturer in business administration in the Graduate School of Business Administration, University of Virginia.

Harold Miller, formerly of Loyola University of the South, is now assistant professor at the College of Business Administration, University of Georgia.

M. D. Mills has resigned as instructor in economics, University of Florida, to accept a Civil Service appointment with the Department of the Army.

G. F. Mitch, a member of the teaching staff of the College of Business Administration, University of Florida for the past several years, has retired.

Charles Thomas Moore, assistant professor of business administration at Mississippi State College, has been granted a leave for further graduate study at Indiana University.

Clarence A. Moore, formerly of the University of Chicago, has been appointed assistant professor of agricultural economics at Texas A. and M. College.

Edwin F. Moore has resigned his position in the School of Business, Baylor University, to enter private business.

Henry Moore has resumed his teaching duties at the University of Alabama after an assignment with the Foreign Operations Administration in Europe where he worked as a member of a productivity team.

John R. Moore has been promoted to assistant professor of economics at the University of Tennessee.

Clarence C. Morrison has been appointed teaching fellow in economics at the University of North Carolina.

Richard L. D. Morse has resigned as professor of family economics at Florida State University to accept appointment as head of household economics at Kansas State College.

George Moss has returned to the Accounting Department of the School of Business Administration, University of Miami, as assistant professor of accounting after spending a year in California doing graduate work.

William H. Nicholls, professor of economics at Vanderbilt University, served as technical director of the Seventh American Assembly (Graduate School of Business, Columbia University) on "United States Agriculture: Perspectives and Prospects," which met at Arden House, Harriman, New York, on May 5–8, 1955.

Howard W. Nicholson, assistant professor of economics at the University of Virginia, has been granted a year's leave of absence to teach at the University of California.

John T. O'Neil returned to his position as associate professor of finance at the University of North Carolina in the fall after a year's assigned leave of absence under the Scott Paper Company's fellowship program.

James M. Owen has been promoted to associate professor of accounting at Louisiana State University.

James M. Parrish, assistant professor of economics and assistant dean in the School of Business Administration, University of North Carolina, has resigned to accept an appointment of associate professor of marketing at Washington University.

Burke A. Parsons, who has been doing graduate work in economics at the University of Texas, has returned to the faculty of the Texas College of Arts and Industries with a promotion to the rank of assistant professor of business administration.

James W. Parsons, Jr., instructor in business administration at Louisiana State University, has resigned to accept a position as associate professor of accounting at Baylor University.

James Parthemos has been appointed instructor in the Department of Economics and Business Administration at Duke University.

A. W. Patrick has been appointed assistant professor of accounting in the McIntire School of Business and Commerce of the University of Virginia.

Ernest F. Patterson, of the University of Alabama, has returned from a year's leave on a Ford fellowship at Harvard University.

Louis S. Philhower has been appointed assistant agricultural economist at Clemson College.

Clinton Phillips has been promoted to assistant professor of economics at the University of Tennessee.

John E. Pierce, formerly at Southern Methodist University, has been appointed associate professor of finance at the University of Tennessee.

Lloyd F. Pierce has been made director of the School of Business Administration and Economics at East Tennessee State College.

Murray E. Polakoff, assistant professor of economics at the University of Texas, has been awarded a fellowship by the Fund for the Advancement of Education, Ford Foundation, for the academic year 1955–56. He will spend the year in study at Harvard University.

Richard Powers, dean of the faculty at Alabama College, spent the summer in Dhahran, Saudi Arabia, as guest of the Arabian American Oil Company. While there he assisted the Economic Research Staff in a study of the Saudi Arabian economy.

Malcolm L. Pye, formerly on the staff of the University of Richmond, has been appointed assistant professor of accounting, University of Florida.

Leslie Rasner, assistant professor of insurance at Baylor University, has been named administrative assistant to the dean of the School of Business.

Robert N. Reece has been appointed assistant professor in geography during the leave of absence of James E. Bagwell in the Department of Economics and Business Administration at Alabama Polytechnic Institute.

Curtis G. Reierson, Jr., has been appointed assistant professor of marketing in the School of Business, Baylor University.

William N. Renfroe has resigned his instructorship at the Woman's College of the University of North Carolina to resume his graduate study at the University of Virginia.

Karl D. Reyer, professor of business administration at Louisiana State University, participated in the Fellowship Program of the American Association of University Teachers of Insurance at the Mutual Benefit Life Insurance Company, Newark, New Jersey, during the month of June.

W. Clyde Robinson, who has been doing graduate work at Tulane University, has been appointed assistant professor of economics at Baylor University.

John A. Ryan, formerly of Oklahoma A. and M. College, has joined the staff of the Department of Economics and Business Administration, Texas Western College.

Bevie T. Sanders, formerly of Sul Ross State College, has been appointed to the staff of the Department of Economics and Business Administration, Texas Western College.

E. D. Saunders, of Magnolia, Arkansas, was a visiting associate professor of economics at Louisiana State University during the summer session.

Jerry Scales has been appointed instructor in economics in the School of Business Administration at the University of Miami.

James R. Schlesinger, formerly instructor in economics at Harvard University, has been appointed assistant professor of economics at the University of Virginia.

G. T. Schwenning, professor of business administration at the University of North Carolina, was elected honorary associate member of the American Institute of Management.

Sherman Shapiro has resigned as assistant professor of economics, University of Texas, and accepted an appointment as assistant professor of finance, University of Notre Dame.

Ansel M. Sharp has resigned as instructor of economics at Louisiana State University to accept a position as professor of economics and head of the Economics Department of William Jewel College.

Bernard M. Sliger, assistant professor of economics at Louisiana State University, received his Ph.D. degree at the June commencement from Michigan State College and taught in the Department of Economics at Michigan State College during the summer session.

Kenneth Spaulding, formerly dean of West Liberty State College, has been appointed associate professor of economics at East Tennessee State College.

Joseph J. Spengler, professor of economics and director of Graduate Studies in Economics at Duke University, was named president-elect of the Population Association of America and will serve during 1956–1957.

Thomas M. Stanback, Jr., has been granted a leave of absence from his position as assistant professor of economics at the University of North Carolina during 1955–1956 to accept a research appointment with the National Bureau of Economic Research.

Harry Starke has been promoted to assistant professor of economics at the University of Miami School of Business Administration.

Carl Stern has been promoted to associate professor of economics at Randolph-Macon Woman's College.

Robert A. Strahl has been promoted to professor of marketing at the University of Tennessee.

Harold Streetman, formerly of Clemson College, has become associate agricultural economist at Alabama Polytechnic Institute.

Floyd Swann has been appointed instructor in the Management Department at the University of Miami School of Business Administration.

James W. Sweeney, formerly of Georgia Institute of Technology, is now associate professor of management in the School of Business Administration, Tulane University.

William A. Terrill, associate professor of accounting in the University of North Carolina School of Business Administration, received a Lybrand Award at a convention of the National Association of Cost Accountants last summer for the outstanding character and excellence of his contribution to the literature of industrial accounting. He was awarded a certificate of merit for his recent article, "Cost Basis, The Samson's Tresses of Accounting."

William J. Thomas, associate professor of statistics, School of Business, Baylor University, has been named director of the Bureau of Business and Economic Research at that school.

Kenneth Thompson, associate professor of economics, Louisiana State University, has been granted a leave of absence for the 1955–56 session to participate in the University of Maryland's Armed Services overseas program in Europe.

R. B. Thompson, formerly with the University of Texas, has been appointed associate professor of marketing, University of Florida.

Lynn Townsend has been promoted to professor of business law at the University of Tennessee.

R. N. Traxler, Jr., formerly in the Training Department of Kraft Foods, has been appointed assistant professor of management, University of Florida.

Wallace Trevillian has been made head of the newly created Department of Industrial Management at Clemson College.

Joseph Trosper has resigned from the staff of the University of Tennessee and has been appointed associate professor of finance at Southern Methodist University.

Wendell P. Trumbull has resigned as professor of accountancy at the University of Mississippi to accept a position at New York University.

Bernard Udis has left Princeton University and has been appointed assistant professor of economics at the University of Tennessee.

Vern Vincent, associate professor of accounting at the University of Tennesse, is on leave for the coming year under a grant from the Southern Fellowship Fund.

Frank T. de Vyver has retired as vice president in charge of personnel and industrial relations at Erwin Mills and has returned to full-time teaching in the Department of Economics and Business Administration at Duke University.

George Waggoner has been promoted to professor of business education and office administration at the University of Tennessee.

Weldon Walker is teaching accounting at Arkansas Polytechnic Institute.

Laurene A. Wallace has been appointed instructor in sociology in the Department of Economics and Business Administration at Alabama Polytechnic Institute.

Alf H. Walle has been appointed professor of economics at Tennessee Wesleyan College.

Harry I. Warner has been promoted to assistant professor in the Department of Accounting, School of Business Administration, University of Miami.

Barton A. Westerlund, assistant professor of marketing, School of Business Administration, University of Miami, has been on leave of absence and has been serving as research assistant with the Marine Laboratory at the University of Miami. During the present academic year he will be on half-time teaching in the School of Business Administration and half-time on research with the Marine Laboratory.

Howard S. Whitney, formerly of Oklahoma A. and M. College, has been appointed assistant professor of agricultural economics at Texas A. and M. College.

Thomas L. Williams, assistant professor of accounting at the College of Business Administration, University of Georgia, has resigned to enter the private practice of accounting.

Norman J. Wood has resigned from the University of Tennessee and has been appointed assistant professor of economics at the University of Georgia.

Porter Wood, formerly assistant professor at the College of Business Administration, University of Georgia, has accepted an appointment at the University of Rhode Island.

Charles Wurst, assistant professor of marketing in the School of Business Administration at the University of Miami, has been granted a leave of absence for the next academic year to complete graduate work.

H. B. Young has been promoted to professor of business at the Agricultural, Mechanical and Normal College (Arkansas) upon returning from three year's of study at Harvard University where he received his doctorate last June.

A. W. Zelomek has been appointed visiting professor of marketing in the Graduate School of Business Administration, University of Virginia.

* * *

The following names have been added to the membership of the Southern Economic Association:

George L. Capel, University of Florida, Gainesville, Fla.
Eli W. Clemens, University of Maryland, College Park, Md.
W. T. Ferrier, Clemson College, Clemson, S. C.
J. W. Fortenberry, Alcorn A. and M. College, Lorman, Miss.
W. L. Gibson, Jr., Virginia Polytechnic Institute, Blacksburg, Va.
Werner T. Hirsch, Washington University, St. Louis, Mo.
William Lentz Ivey, University of North Carolina, Chapel Hill, N. C.
Daniel H. Kruger, University of Alabama, University, Ala.

Roy L. Lassiter, Jr., University of Florida, Gainesville, Fla.
Richard Lyles, Alcorn A. and M. College, Lorman, Miss.
S. W. McFarland, Atlanta Division, University of Georgia, Atlanta, Ga.
David D. Martin, Washington University, St. Louis, Mo.
F. F. Parsons, Sears, Roebuck & Company, Atlanta, Ga.
James S. Plaxico, Oklahoma A. and M. College, Stillwater, Okla.
Harold A. Raasch, Atlanta Division, University of Georgia, Atlanta, Ga.
H. C. Spurlock, University of Florida, Gainesville, Fla.
E. A. Thompson, Union University, Jackson, Tenn.
John Tredtke, Rollins College, Winter Park, Fla.
Klaus H. Wolff, Rollins College, Winter Park, Fla.

# BOOKS RECEIVED

*Farm and Other Operating-Unit Land-Use Planning.* By John D. Black and the Seminar in Land-Use and Conservation of Harvard University. Cambridge, Mass.: Harvard University Press, 1955. Pp. 119. Paper, 50¢.

*The Korean War and United States Economic Activity, 1950–1952.* By Bert G. Hickman. New York: National Bureau of Economic Research, 1955. Pp. viii, 64. Paper, 75¢.

*Public Policies Toward Business.* By Clair Wilcox. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xix, 898. $6.50.

*Principles of Economics.* By W. Nelson Peach. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xvi, 704. $6.00.

*The Political Economy of American Foreign Policy: Its Concepts, Strategy, and Limits.* Report of a Study Group Sponsored by The Woodrow Wilson Foundation and The National Planning Association. New York: Henry Holt and Co., 1955. Pp. xv, 414. $6.00.

*Marginal-Cost Price-Output Control: A Critical History and Restatement of the Theory.* By Burnham Putnam Beckwith. New York: Columbia University Press, 1955. Pp. viii, 283. $5.75.

*Personnel Management: A Human Relations Approach.* By William H. Knowles. New York: American Book Company, 1955. Pp. xvi, 488. $4.50.

*A Guide to the Guaranteed Wage.* By Jack Chernick. New Brunswick, N. J.: Institute of Management and Labor Relations, Rutgers University, 1955. Pp. 50. Paper, $1.00.

*The World of Tomorrow: What Will It Be Like?* Prepared by The Economic Research Defartment. Washington, D. C.: Chamber of Commerce of the United States, 1955. Pp. 31. Paper, 50¢.

*Soviet Taxation: The Fiscal and Monetary Problems of a Planned Economy.* By Franklyn D. Holzman. Cambridge, Mass.: Harvard University Press, 1955. Pp. xix, 376. $6.50.

*Economics and the Public Interest.* Edited by Robert A. Solo. New Brunswick, N. J.: Rutgers University Press, 1955. Pp. xiv, 318. $5.75.

*A Century and a Half of Federal Expenditures.* By M. Slade Kendrick and Mark Wehle. New York: National Bureau of Economic Research, 1955. Pp. x, 102. Paper, $1.25.

*Business Law: Principles and Cases.* By Harold F. Lusk. 5th ed. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xviii, 1061. $6.75.

*Writing Business Letters.* By J. H. Menning and C. W. Wilkinson. 5th ed. Homewood, Ill.: Richard D. Irwin, 1955. Pp. vii, 542. $5.50.

*Introduction to Business.* By Michael J. Jucius and others. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xv, 675. $6.00.

*Marketing Handbook for the Prefabricated Housing Industry.* By Glenn H. Beyer and James W. Partner. Ithaca, N. Y.: Cornell University Housing Research Center, 1955. Pp. 64. Paper.

*Modern Marketing: Dynamics and Management.* By Harry Walker Hepner. New York: McGraw-Hill Book Co., 1955. Pp. viii, 599. $6.00.

*Economic Analysis.* By Kenneth E. Boulding. 3rd ed. New York: Harper & Brothers, 1955. Pp. xx, 905. $6.50.

*Principles of Inland Transportation.* By Stuart Daggett. 4th ed. New York: Harper & Brothers, 1955. Pp. xx, 788. $6.00.

*Current Economic Problems.* By Henry William Spiegel. Rev. ed. Homewood, Ill.: Richard D. Irwin, 1955. Pp. x, 682. $6.00.

*Housing Taxation.* By Walter A. Morton. Madison, Wis.: University of Wisconsin Press, 1955. Pp. x, 262. $4.75.

*Profit Management and Control.* By Fred V. Gardner. New York: McGraw-Hill Book Co., 1955. Pp. x, 285. $6.00.

*Economic Planning in Communist China.* By Ronald Hsia. New York: International Secretariat, Institute of Pacific Relations, 1955. Pp. 90. Paper, $1.25.

*The Federal Antitrust Policy: Origination of an American Tradition.* By Hans B. Thorelli. Baltimore, Md.: Johns Hopkins Press, 1955. Pp. xvi, 658, $8.00.

*How to Invest Your Money.* By Ralph C. Epstein. New York: Ronald Press Co., 1955. Pp. vii, 215. $3.50.

*The Scope and Method of Political Economy.* By John Neville Keynes. 4th ed. New York: Kelley & Millman, 1955. Pp. xiv, 382. $6.00.

*Input-Output Analysis: An Appraisal.* By the Conference on Research in Income and Wealth. A Report of the National Bureau of Economic Research. Princeton, N. J.: Princeton University Press, 1955. Pp. x, 371. $7.50.

*The Hard-Surface Floor-Covering Industry: A Case Study of Market Structure and Competition in Oligopoly.* By Robert F. Lanzillotti. Pullman, Wash.: State College of Washington Press, 1955. Pp. xiii, 204. $4.00.

*Capital Formation in Canada, 1896–1930.* By Kenneth Buckley. Toronto, Canada: University of Toronto Press, 1955. Pp. x, 163. $3.25.

*The United Nations and the Maintenance of International Peace and Security.* By Leland M. Goodrich and Anne P. Simons. Washington, D. C.: Brookings Institution, 1955. Pp. xiii. 709. $6.00.

*The Business Enterprise as a Subject for Research.* By Howard R. Bowen. New York: Social Science Research Council, 1955. Pp. viii, 103. Paper, $1.25.

*Federal Trade Commission Report on Corporate Mergers and Acquisitions, May 1955.* By Edward F. Howrey. Washington, D. C.: United States Government Printing Office, 1955. Pp. vii, 210. Paper, 55¢.

*Money and Banking.* By Eugene S. Klise. Cincinnati, Ohio: South-Western Publishing Co., 1955. Pp. viii, 744. $5.75.

*Advanced Accounting.* By Wilbert E. Karrenbrock and Harry Simons. Cincinati, Ohio: South-Western Publishing Co., 1955. Pp. xii, 948. $6.50.

*Case Studies in Industrial Management.* By J. M. Juran and Norman N. Barish. New York: McGraw-Hill Book Co., 1955. Pp. 256. $5.00.

*The Spatial Structure of Economic Development in the Tennessee Valley: A Study in Regional Planning.* By John R. P. Friedmann. Chicago, Ill.: University of Chicago Press, 1955. Pp. xiv, 187. Paper, $3.00.

*Natural Resources: The Economics of Conservation.* By Anthony Scott. Toronto, Canada: University of Toronto Press, 1955. Pp. ix, 184. $3.25.

*Readings in Economics.* Edited by Paul A. Samuelson and others. 2nd ed. New York: McGraw-Hill Book Co., 1955. Pp. xi, 488. $4.50.

*American Society: An Introductory Analysis.* By Luke Ebersole. New York: McGraw-Hill Book Co., 1955. Pp. x, 510. $5.50.

*The Nation Looks at Its Resources: Report of the Mid-Century Conference on Resources for the Future.* Edited by Henry Jarrett and others. Menasha, Wis.: George Banta Publishing Co., 1955. Pp. xii, 418. Paper, $5.00.

*Readings in Marketing: From Fortune.* Edited by George H. Brown. New York: Henry Holt and Co., 1955. Pp. ix, 134. Paper, $1.25.

*Creative Advertising.* By Charles L. Whittier. New York: Henry Holt and Co., 1955. Pp. xviii, 585. $6.00.

*Uncertainty in Economics and Other Reflections.* By G. L. S. Shackle. Cambridge, England: Cambridge University Press, 1955. Pp. xiv, 267. $4.75.

*Oral Communication in Business.* By David C. Phillips. New York: McGraw-Hill Book Co., 1955. Pp. ix, 229. $3.75.

*Methods of National Income Estimation.* UN pub. New York: Department of Economic and Social Affairs, Statistical Office of the United Nations, 1955. Pp. 58. Paper, 50¢.

*Handbook of Statistical Organization.* UN pub. New York: Statistical Office of the United Nations, 1955. Pp. iii, 138. Paper, $1.50.

*International Bibliography of Economics.* Unesco pub. Paris, France: United Nations Educational, Scientific and Cultural Organization, 1955. Pp. 429. Paper, $7.50.

*Readings in Fiscal Policy.* Selected by Arthur Smithies and J. Keith Butters. Homewood, Ill.: Richard D. Irwin, 1955. Pp. x, 596. $5.00.

*Leadership for Life Insurance: The College Graduate in the Life Insurance Company Home Office.* By Oscar Harkavy. Chapel Hill, N. C.: University of North Carolina Press, 1955. Pp. xvi, 229. $5.00.

*A Statistical Study of Livestock Production and Marketing.* By Clifford Hildreth and F. G. Jarrett. New York: John Wiley & Sons, 1955. Pp. xiii, 156. $4.50.

*Commercial Air Transportation.* By John H. Frederick. 4th ed. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xii, 547. $6.00.

*Statistical Methods.* By Frederick C. Mills. 3rd ed. New York: Henry Holt and Co., 1955. Pp. xviii, 842. $6.90.

*Industrial and Commercial Geography.* By J. Russell Smith and others. 4th ed. New York: Henry Holt and Co., 1955. Pp. xiii, 689. $6.95.

*Security for All and Free Enterprise: A Summary of the Social Philosophy of Josef Popper-Lynkeus.* Edited by Henry I. Wachtel. New York: Philosophical Library, 1955. Pp. xi, 162. $3.00.

*Economic Accounting: A Textbook in Accounting Principles for Students of Economics and the Liberal Arts.* By John P. Powelson. New York: McGraw-Hill Book Co., 1955. Pp. xii, 500. $7.50.

*Minimum Price Fixing in the Bituminous Coal Industry.* By Waldo E. Fisher and

Charles M. James. Princeton, N. J.: Princeton University Press, 1955. Pp. xxxi, 523. $10.00.

*Commercial Motor Transportation*. By Charles A. Taff. Rev. ed. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xiii, 673. $6.00.

*Agricultural Equipment Financing*. By Howard G. Diesslin. New York: National Bureau of Economic Research, 1955. Pp. xvi, 95. Paper, $1.25.

*The Quest for Freer Trade*. UN pub. New York: Department of Economic and Social Affairs, 1955. Pp. v, 59. Paper, 40¢.

*World Economic Report, 1953–54*. UN pub. New York: Department of Economic and Social Affairs, 1955. Pp. viii, 163. Paper, $1.75.

*The Crisis of the Middle Class*. By Henry Grayson. New York: Rinehart & Co., 1955. Pp. xv, 172. $2.75.

*The Price System and Resource Allocation*. By Richard H. Leftwich. New York: Rinehart & Co., 1955. Pp. x, 372. $4.50.

*Basic Data of the American Economy*. By W. Nelson Peach and Walter Krause. 4th ed. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xii, 135. Paper, $2.00.

*Review of Economic Activity in Africa: 1950 to 1954*. UN pub. New York: Department of Economic and Social Affairs, 1955. Pp. xii, 146. Paper $1.50.

*Economic Developments in the Middle East, 1945 to 1954*. UN pub. New York: Department of Economic and Social Affairs, 1955. Pp. x, 236. Paper, $2.50.

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